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THE MINERAL WATERS AND MEDICINAL SPRINGS OF ESSEX

MILLER CHRISTY & MAY THRESH

Presented by G.W. Tyrrell.

MINERAL WATERS AND MEDICINAL SPRINGS OF ESSEX.

The Old Pump-Room, Hockley Spa, Essex.
(*Erected 1842.*)

ESSEX FIELD CLUB SPECIAL MEMOIRS.—VOL. IV.

A HISTORY OF THE MINERAL WATERS AND MEDICINAL SPRINGS OF THE COUNTY OF ESSEX.

By MILLER CHRISTY, F.L.S., and
MISS MAY THRESH.

WITH A CRITICAL NOTE BY W. H. DALTON, F.G.S.,

AND SEVEN ILLUSTRATIONS.

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NOTE.—The matter following was read, in the form of a paper, before a meeting of the Essex Field Club on the 30th November 1907. It is now reprinted, with additions, from the "Essex Naturalist," xv, pp. 185-253 (1909).

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LIST OF ILLUSTRATIONS.

ERRATA.

On p. 4, second line, "*are*" should read "*is.*"

On p 27, sixth line from bottom, "*roof*" should read "*proof.*"

On p. 40, bottom line of text, "*André*" should read "*Andree.*"

On p. 42, tenth line from bottom, *2·05* should read *20·5*.

On p. 68, second line, "*water*" should read "*waters.*"

A HISTORY OF THE MINERAL WATERS AND MEDICINAL SPRINGS OF ESSEX.

I.—INTRODUCTORY REMARKS.

From very early times, the waters of those natural springs which happen to be impregnated with various salts have been used for medicinal purposes and often valued very highly.

Such is the case, to a certain extent, even in the present day. The waters of Harrogate, Bath, Tunbridge Wells, Matlock, Cheltenham, and other places in this country are still drunk regularly; as are those of Homburg, Carlsbad, Marienbad, Wiesbaden, Kissingen, and many other places on the Continent of Europe. It must be confessed, however, that most of those who visit these places derive quite as much benefit from the change, the rest, and the quiet plain living in hotels or hydropathic establishments, under the personal supervision of a medical man, as they do from actually "taking the waters." The dictates of fashion often have, too, much more to do with the vogue of a particular spring than its curative value.

Our English Mineral Springs have been valued, as stated already, from early times; but their recorded history can scarcely be said to have commenced before the Seventeenth Century, during which various treatises on particular wells were published. Among the earlier was that of Dr. Edmund Deane, of York, on the Harrogate Springs (1626). Another work on the same springs, by Dr. John French, of London, appeared a quarter of a century later (1652). Soon after, Dr. Robert Wittie, of York, published a work on the Scarborough Spa (1660); while other writers described the springs at Bath, Cheltenham and elsewhere.

The foregoing were all treatises on particular springs. Of English works of a more general nature, one of the earliest appears to have been that by Dr. Tobias Whitaker, of Norwich, entitled *A Discourse of Waters* (1634)—a diminutive and not very valuable volume.

The earliest thorough and systematic treatise on English medicinal waters appears to have been that by the celebrated Dr. Martin Lister, F.R.S., published in 1684.[1] This was followed, a few months later, by another important work on the same subject by a still more eminent man—the Hon. Robert Boyle, F.R.S.[2] Both these were general works, dealing with the subject of mineral springs as a whole, rather than with particular springs ; but, owing to the backward state of chemical knowledge at the time when they were published, neither has now any scientific value whatever. Nor does either make any special reference to our Essex springs.

These two works were followed, after an interval of about fifteen years, by a work of more special interest, because it dealt, not with Mineral Waters as a whole, but with the waters of a number of particular springs. This work,[3] published in 1699, was by Dr. Benjamin Allen ; and, as its author was an Essex man, residing at Braintree, he gave, not unnaturally, special attention to the Mineral Springs of the county, eight of which he describes, as will be noticed hereafter.

Our English Mineral Springs had come, therefore, prominently into notice during the Seventeenth Century. Yet they seem (whatever may have been the case in other countries) to have been more highly valued and more largely resorted to during the Eighteenth Century and early part of the Nineteenth than at any other period. This was an age when heavy drinking was fashionable, and the test of gentility was the ability to consume so many bottles of port at a sitting. In these "three-bottle" days, Society felt, no doubt, the need of "corrective" medicine, and the purging action of the water of mineral springs was found, without doubt, highly beneficial. Accordingly, whenever a spring possessing these medicinal properties was discovered, steps were taken to develop it ; a

1 *De Fontibus Medicatis Angliae, Exercitatio Nova et Prior*, . . . London, Frankfort, and Leipzig, 1684.

2 *Short Memoirs for the Natural Experimental History of Mineral Waters*, London, 1684-5.

3 See *post*, p. 6

Spa House, with pump-room, was built; and the spot became in time a place of resort for those in search of health. Later, however, for various reasons, most of our English Mineral Springs fell into disrepute.

It is not difficult to understand why many English Spas, situated in remote out-of-the-way spots and now completely neglected, were once highly valued on account of their medicinal properties. It must be remembered that, in former days, the means of travel and transport were, by comparison with the present time, exceedingly defective. Consequently, with most things—articles of food and of clothing, for instance—the *local* product was valued and consumed or used because it was easily accessible or obtainable, though it may have been, in quality, inferior to the products of other districts or countries which were not readily accessible or obtainable. Such was the case with medicinal springs and their waters. A spring in one's own immediate vicinity was valued and visited, even though its water was of less potency than that of some more distant well, because the more distant well was inaccessible to ordinary people and the cost of bringing water from it was too great. One hundred and fifty or two hundred years ago, a journey from (say) Essex to Harrogate or Cheltenham was a greater undertaking than a journey to Homburg or Marienbad is now: hence the high value formerly set upon many small local springs which are to-day completely forgotten. During the last sixty or seventy years, the introduction of steam transport, in the form of railroads and steamships, has rendered it easy either to visit or to bring water from any known well, however distant. Consequently, most wells of small medicinal value, however near home, are wholly neglected.

Nor is this all; for, in most matters of taste and fashion, distance generally "lends enchantment to the view." To the female mind, for instance, a hat from Paris appears incomparably superior to one designed in London or in one's own town, even though in other respects the Paris hat may present no obvious advantages over the other. Hence, it is not surprising that, to any one in search of health, a famous well in Austria or Germany seems to present advantages not possessed by a well in (say) Kent or Lincolnshire, even though the water of the two may possess, in reality, equal curative value.

Turning to Essex, we find that, in it, as in most other counties, there are a considerable number of springs which have been, in the past, valued for medicinal purposes and visited more or less extensively by persons desiring to drink their waters. Altogether, rather more than a score of such wells have, in the past, attracted the attention of the medical faculty and have attained, in consequence, a certain measure of fame. One of these wells (that at Wanstead) became known at the very beginning of the Seventeenth Century. Some eight others (namely, those at Witham, South Weald, Upminster, Little Leighs, "Felstead" (*i.e.*, Little Dunmow), Markshall, Woodham Ferrers, and Colchester) were known and used at least as early as the end of the Seventeenth Century. About a dozen others (namely, those at Woodford, West Tilbury, Havering, Chigwell Row, Wethersfield, Gidea Hall, Hornchurch, Stapleford Abbots, Springfield, Twinstead, Plaistow, and Ilford) appear to have been discovered during the Eighteenth Century. Only two (namely, those at Hockley and Dovercourt) first became known during the Nineteenth Century.

Of these wells, the Rev. Dr. W. Martin Trinder, of Romford, wrote[4] in 1783 that,

"The many very different medicinal waters in Essex, as they lay a claim to the cure of many different diseases, are proper objects of congratulation to the county, . . .

"That the Essex waters have been, in many cases, useful and efficacious needs no proof; but that women receive greater benefit from them than the men will clearly appear, if, besides other reasons, we recollect that they are, in general, more observant of their physician's advice and closer followers of the salutary rules of temperance."

Nevertheless, even before this time, our Essex springs seem to have declined greatly in fame. Morant, writing in 1768, says[5] of the Mineral Waters of the county that "none have kept up their reputation, except Tilbury Water."

The "Gentleman," writing two years later, evidently follows Morant, but is more explicit. He says[6]:—

"The physical gentlemen formerly made various attempts to discover medicinal waters [in Essex], and, by their industry, had raised those of Tilbury, Witham, Chigwell, and Upminster to some degree of credit; but the three last, of late years, have sunk into obscurity, whilst the former deservedly retains the highest reputation."

4 *Medicinal Waters in the County of Essex*, pp. vi.-viii. 1783).
5 *Hist. of Essex*, i., p. xxv. (1768).
6 *Hist. of Essex*, i., pp. 9-10 (1770

The author of a work published a little more than thirty years later was able to make only the curt statement[7] that "some Mineral Waters rise in the County, but few have obtained much repute."

To-day, every single one of our Essex Mineral Springs, with one exception of little importance, is wholly neglected and almost forgotten. It is for this reason that we have sought to gather up, in the following pages such information in regard to each as it is now possible to recover.

In 1699, a writer in the publications of the Royal Society declared[8] that

> "Whoever discovers . . . Healing Waters and publickly prescribes the safe and right use of them does really distribute larger and nobler almes than if he built and endowed a Savoy; for this prolongs life and restores health (which is sometimes better than life), both to rich and poor, to natives and strangers, to neighbors and travellers."

If we cannot claim credit for having done this, it has seemed to us, nevertheless, that the work we have undertaken was well worth doing. Even as far back as the year 1889, the Editor of the *Essex Naturalist* expressed[9] a hope that he might soon be able to publish in his pages a history and description of the Essex Mineral Springs. He has had to wait just twenty years for the fulfilment of that hope.

In regard to our respective shares in the work, we may say that, in the main, the historical and topographical matter has been supplied by Mr. Christy, while the analytical investigations have been undertaken by Miss Thresh.

We desire to express our indebtedness to many friends and correspondents who have assisted us in our search for lost wells and in obtaining samples of water; to others who have replied by letter or otherwise to our many troublesome enquiries; and to yet others who have lent us books. Among these, we may mention Mr. John Avery, of Forest Gate, Mr. J. H. Burgess, of Hockley, Mr. E. North Buxton, Mr. George Clements, of Hockley, the Messrs. W., B. G., and H. A. Cole, of Buckhurst Hill, Mr. Walter Crouch, of Wanstead, the Rev. J. Bonamy Dobree, of West Tilbury, Mr. E. A. Fitch, the Rev. Canon Fraser, of South Weald, Mr. John French, the late Mr. I. Chalkley

7 *Beauties of Engl. & Wales*, v., p. 252 (1803).
8 *Philos. Trans.*, iv., p. 1040 (1699).
9 *Essex Nat.*, iii., p. 198 (1889).

Gould, F.S.A., Mr. M. E. Hughes-Hughes, of Leez Priory, the Rev. Canon Ingles, of Witham, Dr. Henry Laver, of Colchester, the Rev. Thomas Myers, of Twinstead, Mr. Christopher W. Parker, of Faulkbourne, Mr. W. Ping, of Wanstead, the Rev. C. P. Plumtree, of Woodham Ferrers, the Rev. L. N. Prance, of Stapleford Tawney, Mr. Philip Savill, of Chigwell Row, Mr. C. B. Sworder, of Epping, Mr. G. E. Tasker, of Ilford, Mr. C. J. H. Tower, of Weald Hall, Mr. H. Warren, of Dovercourt Spa, and Mr. Hastings Worrin, of Little Dunmow.

We are indebted in a still greater degree to Mr. J. C. Thresh, D.Sc., M.D., and Mr. W. H. Dalton, F.G.S., F.C.S., who have been kind enough to go through our matter and give us much valuable criticism and advice, chiefly on chemical and geological points. Mr. Dalton's suggestions as to the probable geological origins of the various waters described will be found chiefly in Section III. hereafter.

It will be convenient, we think, if, before discussing each of our Essex wells in detail, we insert—

II.—A BIBLIOGRAPHY (ARRANGED CHRONOLOGICALLY) OF THE MORE IMPORTANT WORKS TREATING OF ESSEX MINERAL SPRINGS.

1699.—*ALLEN, Benj.*, M.B.—The Natural History of the Chalybeat & Purging Waters of England, with their Particular Essays and Uses. . . . London: Printed and Sold by S. Smith & B. Walford, at the Prince's Arms, in St. Paul's Churchyard, 1699.

[40]+185+[6] pp, post octavo. Dedicated to Charles, fourth Earl of Manchester, then living at Leighs Priory.

This is practically the earliest systematic treatise on the Mineral Springs of England. Though valuable in its day, it is a very poor production from the literary point of view, having been written mainly (as the author tells us in his Preface) whilst he was an undergraduate at Cambridge, with very little leisure. The diction and punctuation are, therefore, very defective.

The author treats of eight Essex Mineral Springs—namely, those at Leighs (pp. 18-19), Witham (p. 19), Mark's Hall (p. 21), "Felstead" (i.e., Little Dunmow: p. 28), Colchester (p. 128), South Weald (pp. 144-147), Upminster (p. 148), and Woodham Ferrers (pp. 158-160).

Dr. Allen (1664-1739) was a son of Dr. Benj. Allen, of London. After studying at Queen's Coll., Cambridge, he commenced practice (apparently before 1686) at Braintree, where he became intimate with John Ray and Samuel Dale, both then living there. He was an excellent naturalist. He married Katherine, daughter of Dr. Joshua Draper, first of London, but afterwards of Braintree. Dying 28th Feb. 1739-40, aged 75, he was buried in the churchyard at Black Notley (where he had probably gone to reside), immediately adjacent to his friend Ray (see *Essex Nat.*, iv., pp. 192-193).

1711.—*ALLEN, Benj.*, M.B.—The Natural History of the Mineral-Waters of Great Britain; to which are added some Observations of the Cicindela or Glow-Worm. London: Printed for the Author and Sold by William Innys, at the Prince's Arms, in St. Paul's Church-Yard, 1711.

[xxxii]+104 pp., demy octavo, with plate. Dedicated to Charles, fourth Earl of Manchester. The preface is dated from "Braintry, in Essex, Aug.6, 1710." There is a long "Epistle Prefatory" to Dr. Martin Lister, Physician to the Queen, and Dr. Tancred Robinson, each of whom wrote the author a brief commendatory letter, which he prints.

This is not a mere second edition of Allen's book of 1699, but an almost-completely-new work; and it is very much better written and arranged than his earlier effort. In it, he disregards several of the Essex Mineral Springs which he described in his earlier work. Indeed, he now notices five only—namely—those at Upminster (p. 18), Woodford (pp. 19-20), South Weald (pp. 20-21), "Felstead" (p. 30), and Woodham Ferrers (pp. 35-36).

1737.—*TAVERNER, James*, M.B.—An Essay upon the Witham Spa; or a brief Enquiry into the Nature, Virtues, and Uses of a Mineral Chalybeate Water at Witham, in Essex. . . . London: Printed for B. Motte & C. Bathurst, at the Middle-Temple Gate, Fleet-Street, MDCCXXXVII.

[viii] + 60 + 4pp., demy octavo. The Dedication to Dr. John Hollings, F.R.S., one of the King's Physicians-in-Ordinary, is dated from "Witham, August 1, 1737."

Dr. James Taverner (17—?-17—?) was born at Maldon, Essex. He was admitted a pensioner of Clare Hall, Cambridge, 17 Mar. 1725; was admitted Extra-Licentiate of Coll. of Physicians 18 Feb. 1731-2; proceeded to Bach. Med. at Cambridge, 1733; practised first at Sudbury, Suffolk, and later at Witham.

1737.—[*ANDREE, John*].—An Account of the Tilbury Water. . . . London: Printed for M. Jenour and sold by J. Clarke, under the Royal Exchange, and W. Meadows, at the Angel in Cornhill, 1737. (Price Six Pence.)

[iv] + 38pp., demy octavo (about). Dedication to Sir Hans Sloane, Bart., Physician to the King and President Royal Society.

The work was written in 1736 (see pref. to later editions). The author's name appears only at the end of the Dedication, which is undated. There were later editions in 1740, 1764, 1779, and 1781.

Dr. John Andree (1697—1785), whose place of birth is unknown, was an eminent London physician and a writer on medical subjects. He was practically the founder of the London Hospital (1740) and remained physician to it until 1764.

1740.—[*ANDREE, John*].—An Account of the Tilbury Water, containing a Narrative of the Discovery of the Medicinal Qualities of this Spring, Experiments on the Water, Observations on the Experiments, the Vertues of the Water, interspersed with various Cases, the Manner of Drinking it, and lastly, several remarkable Cures. . . . The Second Edition, with Additions. London: Printed for W. Meadows, at the Angel, in Cornhill. MDCCXL. (Price Six Pence).

[iv] + iv. + 40 pp., demy octavo. The Dedication to Sir Hans Sloane, Bart., Pres.R.S, Physician to the King, remains, and is now dated from "Broad Street, Decemb. 15, 1739"; but the matter of it differs from that of the first edition. The author's name still appears nowhere, except at the end of the Dedication. There is also a Preface.

This is an entirely new edition (not a mere reissue), having been revised and reset throughout. There were later editions in 1764, 1779, and 1781.

1757.—*RUTTY, John*, M.D.—A Methodical Synopsis of Mineral Waters, comprehending the most celebrated Medicinal Waters, both Cold and Hot, of Great Britain, Ireland, France, Germany, and Italy, and several other Parts of the World ; . . . London : Printed for William Johnston at the Golden Ball, in St. Paul's Churchyard. MDCCLVII.

xxxvi + [47] + 660 + [8] pp., demy quarto, with various tabular statements insetted.

This is a large and important work, incorporating much original research. It was attacked violently in *An Analysis of Dr. Rutty's "Methodical Synopsis"* (London, 1757), written by Dr. Charles Lucas, a Dublin physician of a controversial and disputatious turn of mind. Lucas describes Rutty's book as a "most heavy, massive, muddy work," and applies to it many other similar epithets ; but his strictures seem to have been due in the main to professional jealousy. Rutty replied effectively and with dignity in a pamphlet entitled *The Analyser Analysed* (Dublin, 1758: reprinted, with variations, in London, in same year). The controversy was, however, nothing more than an unprofitable professional squabble.

Rutty describes only three Essex Mineral Springs—namely, those at Upminster (pp. 124-5), Witham (pp 384-386), and Tilbury (pp. 426-429). From both Upminster and Tilbury, he had had samples of the water sent to him in Dublin and had there analysed them, with results which he gives ; but, as regards Witham, he merely condenses the information given by Taverner.

Dr. John Rutty (1698-1775) was born in Wiltshire, of Quaker parentage. He settled in 1724 in Dublin, where he practised as a physician and lived throughout life. He wrote on the history of Quakerism, the natural history of the County Dublin, and other subjects, medical and scientific.

1764.—[*ANDREE, John*, M.D.].—An Account of the Tilbury Water, containing a Narrative [&c., as in the 2nd ed.]. . . . The Third Edition, with Alterations. London : Printed for J. Brotherton, at the Bible, in Cornhill. MDCCLXIV. (Price Six Pence.)

40 pp., demy octavo. The Dedication to Sir Hans Sloane (who had died in 1753) is retained, the wording being the same as in the second ed., but the dating is altered to "Austin-Fryars, Dec. 15, 1739." There is also a Preface, the matter of which differs largely from that of 1740.

This is another completely-new edition, reset throughout. There were later editions in 1779 and 1781.

1770. *MONRO, Donald*, M.D.—A Treatise on Mineral Waters. In two volumes. London : Sold by D. Wilkinson and G. Nicol in the Strand, and T. Durham, Charing Cross. MDCCLXX.

Vol. i, xxiv + 475pp., and vol. ii, 8 +419 pp., demy octavo.

This work is mainly a compilation from earlier works, and shows little original research.

The author notices eight Essex springs—namely, those at Tilbury (pp. 78-82), Colchester (p. 151), South Weald (p. 151), Upminster (pp. 151 and 218), Leez (p. 268), Marks Hall (p. 268), "Felstead" (p. 269), and Witham (pp. 359-360). In nearly every case, however, the notice given is very brief and in no case is new information added to that given by earlier writers, chiefly Allen and Rutty.

Dr. Monro (1717-1792) was born at Edinburgh, where he took his degree of M.D. on 8 June 1753. He became an Army Surgeon, but afterwards settled in London, where he became eminent in his profession. He was elected F.R.S. in 1766 and F.R.C.P. in 1771, holding afterwards many posts connected with the College. He died in London.

1779.—[*ANDREE, John*, M.D.]—An Account of the Tilbury Water, containing a Narrative [&c., as in the 2nd and 3rd eds.]. . . . The Fourth Edition, with Alterations. London : Printed for John Ellison. MDCCLXXIX.

39 pp., demy octavo (about). The author's name appears only at the end of the Preface (pp. 3-4), which is dated from "Hatton Garden, January 20, 1779," and is almost identical with that in the 3rd ed. The Dedication to Sir Hans Sloane (d. 1753) is omitted.

This is another completely new edition, the book having been again reset throughout. There was a later edition in 1781. The John Ellison whose name appears as publisher was the agent for the sale of the water in London (see *post*, p. 38).

1781.—[*ANDREE, John*].—An Account of the Tilbury Water [&c., Fifth edition, London, 1781].

We have seen no copy of this edition, but it is mentioned in the *Dict. of Nat. Biogr.* and by Mr. Dalton (see *post*, p. 10).

1783.—*TRINDER, W. Martin*, LL.B. (Oxford) and M.D. (Leyden).—An Enquiry, by Experiments, into the Properties and Effects of the Medicinal Waters in the County of Essex. . . . London: Printed and sold by J. F. and C. Rivington, in St. Paul's Church Yard; Mr. Faulder, in Bond Street; Mr. Frost, Chelmsford; and Mr. Marshall, Grocer, at Romford, 1783.

xvi + 56pp., demy octavo. The Dedication to Robert Edward, 9th Baron Petre of Writtle, is dated "Romford, January 1783." The Preface (pp. v-xiii) is unsigned.

The author describes ten Essex Mineral Springs—namely, those at Tilbury Hall (pp. 1-8), Tilbury Rectory (pp. 9-12), Gidea Hall (pp. 13-19), Hornchurch Lane (pp. 20-23), "Forest" (*i.e.*, Stapleford Abbots, pp. 24-28), South Weald (pp. 29-34), Upminster (pp. 35-40), Witham (pp. 41-46), Springfield (pp. 47-52), and "Felstead" (pp. 53-56). Of these, four (namely, those at Gidea Hall, Hornchurch, Stapleford Abbots, and Springfield) had not, we believe, been described previously.

The Rev. Dr. Trinder (1747-1818) was a son of David Trinder, of Shadwell, Middlesex. He matriculated at Exeter College, Oxford, on 31 Oct. 1763, at the age of 16, and afterwards proceeded to Leyden, where he took his degree of M.D. He became B.C.L. of Oxford in 1770. He wrote and published several *Sermons*, *An Essay on English Grammar* (before 1783), and a work on the Oil and Air Bath (1812). He died at Rowley Lodge, near Barnet, on 18th Dec. 1818 (See *Alumni Oxon.*, 1715-1886, iv, p. 1439: 1888, and *Gentl. Mag.*, lxxxviii., pt. ii, p. 574: 1818).

1841.—*PHILLIPS, Richard*, F.R.S.—[A Report on his Analysis of the Water of Hockley Spa. 1841.]

A pamphlet. No copy seen by us, but mentioned by Granville (*Spas*, ii, p. 610).

Mr. Phillips (1778-1851) was born in London, of Quaker parentage. He was an eminent chemist, as well as a voluminous writer and lecturer on chemical subjects. He analysed the waters of Bath in 1806, of Cheltenham in 1818, of Weymouth in 1833; was elected F.R.S. in 1822; and was Pres. of the Chemical Society in 1849-50.

1841.—*GRANVILLE, A. B.*, M.D., F.R.S.—The Spas of England. . . . London, 1841.

Consists of three "parts" in two volumes, post octavo.

The only Essex Spa noticed is that at Hockley (called "Southend"), which is described very fully (vol. ii., pp. 606-614).

Dr. Granville (1783-1872) was born in Italy, of mixed English and Italian parentage. After serving as a surgeon in the English Navy, he settled in London, where he practised extensively and became a recognised authority on midwifery. He wrote voluminously on medical subjects, mineral waters, Italian political questions, and the Royal Society, of which he was a keen critic.

1842.—[*GRANVILLE, A. B., Richard PHILLIPS,* and *Another.*]—A Brief Account of Hockley Spa, near Southend, Essex ; with an Analysis of the Water by Richard Phillips, F.R.S.L. and E. London : Published by Richard Groombridge, Panyer Alley, and Henry Guy, Chelmsford. MDCCCXLII.

31+[2] pp., demy octavo, with lithographed frontispiece, showing "The Pump Room" (then being built). A shilling pamphlet, in a green paper cover. The preface is dated "June 1842."

The body of the work consists of a reprint (pp. 5-16) of Dr. Granville's account of the Spa (from his *Spas*, ii., pp. 605-614) ; information (pp. 16-22) about Hockley, its vicinity, and its history, by an anonymous writer ; (pp. 23-31) Phillips's report on his analysis of the water (doubtless reprinted from his pamphlet) ; and (pp. 31-[33]) Testimonials from doctors.

1889.—*DALTON, W. H.*, F.G.S.—A List of Works referring to British Mineral and Thermal Waters. . . . Printed by Spottiswoode and Co., New Street Square, London, 1889.

47 pp., demy octavo. Reprinted from the *Report of the Brit. Assoc. for the Adv. of Sci., Bath Meeting*, 1888, pp. 859-897 (1889).

A very complete and valuable piece of bibliographical work, enumerating no fewer than 740 titles.

It will be seen from the foregoing that the literature relating to our Essex Mineral Springs is considerable, if not voluminous.

There are several important general treatises on the Mineral Wells of Britain which devote a considerable amount of space to those of this county—namely, the works of Allen (1699 and 1711), Rutty (1757), Monro (1770), Granville (1842), and Dalton (1889).

There is one work which treats comprehensively of nearly all our Essex springs—namely, that of Trinder (1783).

Of treatises devoted to the description of some particular Essex spring, there are three (or, counting the various editions, seven)—namely, Taverner on Witham Spa (1737), Andree on Tilbury Well (1737, 1740, 1764, 1779, and 1781), and Phillips on Hockley Spa (1841).

In addition to the foregoing works, there are scattered items of information to be gleaned from the works of the various county historians and topographers—especially Cox (1720), Morant (1768), the "Gentleman" (1769-72), Ogborne (1814-17), and Benton (1875).

III.—PARTICULARS AS TO EACH ESSEX MINERAL SPRING.

At the outset, we may refer to the fact that the parish now known as North Ockendon appears to have been known originally as Wokyndon Septemfontium, or Setfontayna, or

Seetfountaynes, and to have derived this name from seven notable springs which existed within the parish.[10] It has been stated[11] that these were "medicinal springs"; but we can find no evidence that they were so. Apparently they were merely ordinary fresh-water springs.

The earliest Essex Mineral Well of which we have been able to discover any record is

(1.)—*The Wanstead Spring*, which was discovered early in the Seventeenth Century. John Chamberlain, the news-letter writer, writing from London to Sir Dudley Carleton, on 23 August 1619, says[12]:—

"... We have great noise here of a new Spaa, or spring of that nature, found lately about Wansted; and much running there is to yt dayly, both by Lords and Ladies and other great companie, so that they have almost drawne yt drie alredy; and, yf yt should hold on, yt wold put downe the waters at Tunbridge; wch, for these three or foure yeares, have ben much frequented, specially this summer, by many great persons; insomuch that they wch have seene both say that yt [*i.e.*, Tunbridge] is not inferior to the Spaa [in Belgium] for goode companie, numbers of people, and other appurtenances."

We have been quite unable to ascertain anything as to the part of Wanstead parish in which this spring was situated. In all probability, it was quite a small spring. One may infer as much from Chamberlain's statement that, within a short time of its discovery, the company resorting to it had "almost drawn it dry." If such was the case, the spring was, no doubt, soon deserted and ultimately forgotten.

Mr. Walter Crouch, F.Z.S., of Wanstead, whose knowledge of the history of the parish is unequalled, writes us:—

"I have always had the idea that this Mineral Spring was not at the Park end of our parish, which abuts on Bushwood and Wanstead Flats, but in the vicinity of Snaresbrook and on the road which leads to Walthamstow; but it is possible that it was in the grounds of 'The Grove' (now cut up and built over). The spring is not marked on Kip's *View* (1710), nor on Rocque's large *Map* (1735), nor on Rocque's still larger map of a few years later."

Under the guidance of Mr. W. Ping, F.C.S., of Wanstead, Mr. Christy has visited two springs at Snaresbrook—namely, that known as the "Birch Well," in the Forest, near the Eagle Pond, and a spring in the grounds of "The Hermitage"; but

10 A member of the Baudwin or Baldwin family, in 1320, styles himself Badewinus de Wokyndon Setfontans (see Morant, *Hist. of Essex*, i., p. 102).

11 T. L. Wilson, *Upminster*, 2nd ed., p. 19 (1880).

12 *State Papers, Dom., Jas. I.*, CX., no. 26. We are indebted to Mr. G. E. Tasker, of Ilford, for calling our attention to this letter.

neither of these is credited locally with being a mineral spring and neither has any appearance of being such. Since then, Mr. Ping has written us as follows:—"I have spoken with the oldest inhabitant of Wanstead, a Mr. Merryman, whose knowledge, both local and national, is remarkable and accurate. He tells me that the only Mineral Spring he ever heard of in Wanstead was in the grass bordering the roadside nearly opposite the house, in the Blake Hall Road, formerly occupied by Lord Mayor Figgis, and now by Sir John Bethell, M.P. This spring he remembers well. Its water was chalybeate and left considerable reddish deposit. People came and drank it to give them an appetite. They used to kneel down and drink it from their hands, and also took it away in bottles. Others used to bathe their ankles in it to make them strong. Mr. Merryman adds that, about 1870, drainage operations deprived the spring of its water. The fountain, which has since been put up near its site, supplies waterworks water only." Mr. Ping adds that, recently when deeper drainage operations were in progress at the spot, water of a very markedly ferruginous character was encountered. This is no evidence that this spring was identical with that which came into prominence in 1619, but very likely it was.

Mr. Dalton expresses the opinion that, if either surmise as to the position is correct, seeing that the comparison with the Tunbridge Wells chalybeate water was sound, the well in question probably yielded a ferruginous water from the Glacial (?) gravels of the Snaresbrook plateau at their contact with the pyritous London Clay.

In the next place, we must notice the eight springs described by Allen in his first book, published in 1699. Two of these appear to have been known some time—namely those at South Weald and Upminster; but the others seem to have been discovered later, and chiefly by Allen himself. Of the eight, the most important is, perhaps,

(2).—*The South Weald Spring*, which seems to have been well known long before Allen wrote. He says of it[13]:—

"I have known instances of a scorbutic scabies and a leprous disease each increased by drinking the water of Brentwood-weal, which abated upon the use of Woodham Ferrys [water]."

13 *Chalybeate and Purging Waters*, p. 7 (1699).

Elsewhere he says[14] :—

"This water is of taste lixiviate, with a little bitterness, and not free of the maukish taste of the rest [of the mineral waters belonging to the same class], but not so nauseous as Epsam.

"With syrup of violets, it gave a full green, as alkalys [do]; with which it agreed in giving a dusky gold colour, near that of Malaga sack, with Lignum nephriticum[14a]; in turning thick and dark with iron and gall, not black or blewish as vitriols, common salt, and saltpetre. . . . [After detailing the results of many other equally-unsatisfying tests which he applied to the water, he continues :—]The salt wherewith this water is impregnated appears to be a full alkali, ... joyn'd with a hard coagulating acid, not of the nature of common salt, but rather of saltpetre's second salt. And, according to this nature of it, this water will not keep sweet four days; whereas the others will [keep sweet] near three times that time.

"That this [water] should be injurious in leprous cases is very intelligible, from its alkalisateness to raise the blood and ulcerate and its coagulative acidity. . . . This water of Brentwood I have experienced beneficiall in hypochondriacal cases, particularly at the beginning. But the difference of the constitution of the patient is necessary to be consulted. . . . ; for, whereas the melancholy and dull crasis of one patient's blood made this a suitable remedy, yet I observed, in another gentlewoman of the same years, but of a florid sanguine complexion, this water to be of so differing an effect as to cause violent flushings of the body and face and an obstruction of the catamenia; all which, the nature of the salt accounts for "[15]

Another contemporary reference to this well is that of Sir John Bramston, K.B., of Skreens, Roxwell, who relates[16] that, being taken ill on the 1st September 1699, when in his eighty-ninth year, he "tooke some Gascon's pouder and dranck Weald water." The statement implies that the well had already become widely famed and that water from it was valued for certain medicinal purposes.

Yet another early reference to this same well is that of the Rev. Thomas Cox, who, writing in 1720, says[17] that there were in Essex "some springs of a medicinal nature, as those of Upminster and Burntwood Weal."

A description of the well, written rather more than sixty years later than the foregoing, is that of Dr. W. Martin Trinder, who says[18] :—

"The spring is well sheltered from the weather by an arch of brick. The water

14 *Op. cit.*, pp. 144-147.

14a Mr. Dalton points out that this was a preparation of the wood of *Moringa pterygosperma*, an Indian tree.

15 In his work of 1711, Allen gives (pp. 20-21) merely a condensation of the above and no new information

16 *Autobiography*, p. 411 (Camden Soc., 1845).

17 *Magna Britannia*, i. p. 722 (1720).

18 *Medicinal Waters in Essex*, p. 29 (1783).

appears of a bluish colour when viewed from the top. It has a faintish taste, but, in my opinion, not a disagreeable one."

The doctor then gives in detail the results of seventeen experimental tests to which he submitted the water; which tests, he says,[19]

"tend to prove that this water is chiefly selenitic, with a small impregnation of sulphur. It is considered by the common people as a purging-water, but, I think, with no reason; for, although it be drank in very large quantites, it will not act as a purgative in some constitutions.

"The drying and astringent quality of this water must be of great service when the animal secretions become too profuse and in all unnatural discharges of blood, . . .

". . . I have heard that the common people in the neighbourhood wash their sores with this water, with very good effect; but, if they were to make trial of the black sludge about the well, I think that they would not repent of the experiment. . . ."

The well in question still exists. It occupies a secluded position, remote from any footpath, in one of the parks adjoining Weald Hall (C. J. H. Tower, Esq)—not that immediately surrounding the mansion, but the smaller one, known as the "Front Park," which lies on the further side of the road and to the south of the house[19a]. The well is still protected by the above-mentioned dome of brickwork (fig. 1), about five feet high, which looks as though it might have been built about the beginning of the Eighteenth Century. Cut in the bricks are very many names and initials—presumedly those of persons who have visited the well and drunk of its waters.

The Rev. Canon Fraser, vicar of South Weald, says[20]:—

"This well was formerly much frequented and highly appreciated by the sick folk of the neighbourhood, and especially by the poor lepers from the Hospital in Brook Street, on account of its healing qualities.

"There are persons still living who can remember the day when the good people of Brentwood—the sick, the halt, and the withered, as at Bethesda's Pool—used to flock in crowds to drink at the waters of this spring."

Some fifteen years ago, Mr. Charles B. Sworder, of Epping, stated[21] at a meeting of this Club that, at that time, the spring used to be visited after hay-time and harvest by "many agricultural labourers from Stanford Rivers and Stapleford Tawney" (and, doubtless, other neighbouring places), to "take the

19 *Op. cit.*, pp. 32-33.

19a It is marked "Chalybeate Spring" on the 6-inch Ordnance Map.

20 *South Weald: its History, its Churches, its Vicars, etc.* [1895], under descrip. of Weald Hall.

21 *Essex Naturalist*, vii., p. 43 (1893).

waters." "After a gallon of beer a day [he adds], they no doubt needed some little corrective!"

Some of the names cut in the brickwork appear to be recent, which suggests that the well still retains some local fame as a medicinal spring; and Mr. Tower informs us that, even now, he still receives occasionally applications from cottagers and others living in the vicinity, for permission to take water from

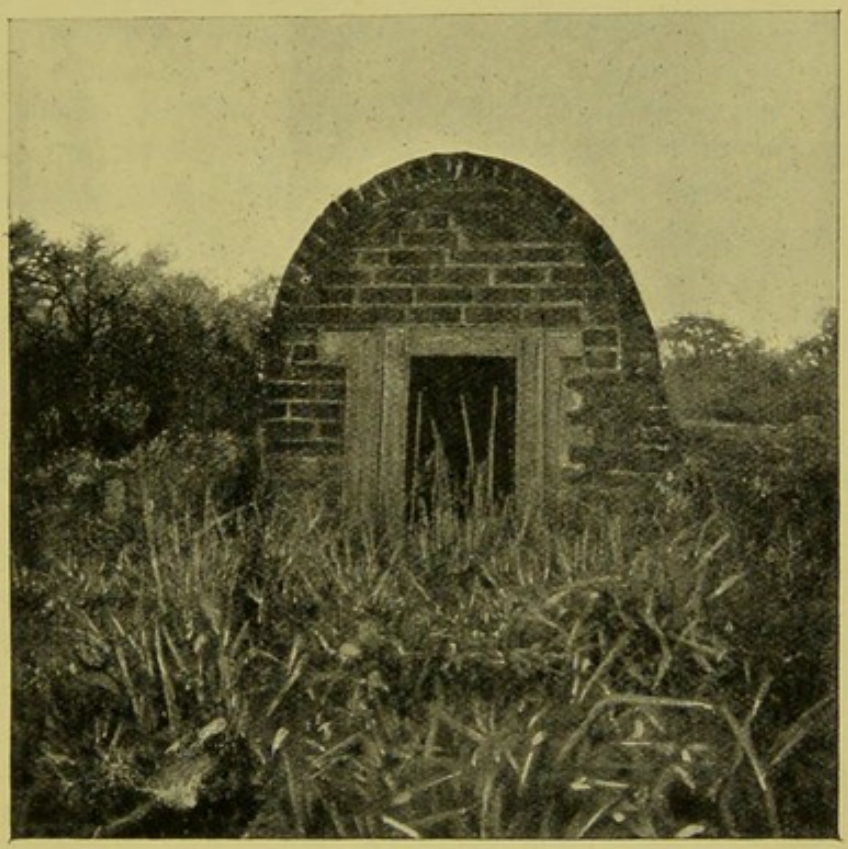

FIG. 1.—THE MINERAL SPRING AT SOUTH WEALD

(from a photograph by Miller Christy).

the well for medicinal purposes.[22] The well itself has now, however, an uncared-for appearance and the water in it looks dirty and uninviting. I have tasted it on the spot, and found it to resemble the flattest ditch-water. Its surface appears to stand normally a little below the level of the surrounding ground, and there are some three or four feet of water in the well. There is

22 Anyone having a desire to visit the well should remember that it is on private property and should ask permission.

no outflow. A sample of the water obtained on the 18th April 1907 yielded the following results :—

Calcium carbonate	17·0	parts per	100,000
Calcium sulphate	59·2	,, ,,	,,
Magnesium sulphate..	104·7	,, ,,	,
Sodium sulphate	38·0	,, ,,	,,
Sodium chloride	10·9	,, ,,	,,
Water of hydration	15·8	,, ,,	,,
Nitrates, silica, etc.	3·4	,, ,,	,,
Total solids	249·0	,, ,,	,,

This is a genuine Mineral Water, somewhat similar in character to that from Hockley Spa, noticed hereafter ; but it contains sodium sulphate (which is not present in the Hockley water) and less sodium chloride.

Mr. Dalton surmises that this water comes from sandy beds in the uppermost part of the London Clay, close to the outcrop of the Bagshot Sands.

(3).—*The Upminster Well.*—Almost exactly two miles due south from the South Weald well, above noticed, is another well which has been famed as a medicinal spring for an almost equally long period. It is situated near the northern end of Tyler's Common, on a southern slope, a couple of hundred yards or so below Tyler's Hall, and not far from the northern extremity of the parish of Upminster—a remarkably-shaped parish, about six miles long, averaging one mile broad, and lying due north and south.[23]

The earliest reference to this well we have found is by Dr. Benjamin Allen, who, writing in 1699, says[24] that the sample of its water, which he had examined, had been sent to him "by the unquestioned hand of Mr. Jeffreys, of Brentwood." Elsewhere, he says[25] that the water

"was very clear [and] of taste bitter, with a sweetish nauseous taste. In the quantity of nine ounces, six drams, and six grains, [it] out-weighed common water 55 grains."

Then follow the results of a number of tests, but he adds no

23 It has been stated several times that this well is identical with one upon which the Rev. Dr. Derham, rector of Upminster, made some notable observations in the opening years of the Eighteenth Century (see his *Physico-Theology*, p. 51 *n* : 1713), but this is an error. The strong spring on which Derham made his observations is that near Pot kilns, from which the cottagers far around still obtain their supply (see Mr. Walter Crouch, F.Z.S., in *Essex Nat.*, iv., p. 196 : 1890).

24 *Chalybeat and Purging Waters of England*, preface, fo.b7, obv.

25 *Op. cit.*, p. 148.

summary, and does not say in what diseases he thought the water would prove beneficial. In his second work (1711), in which practically the same information appears, he classes it among "waters containing a salt alkalial, resembling salt of tartar, and the sulphurous salt of vegetables."[26]

Another early reference to this well is that of Cox, already quoted, which was published in 1720.[27]

In November 1745, Dr. Rutty had samples of the water (bottled some months previously) sent to him in Dublin, where he made experiments upon it :—

"It was [he says[28]] clear and void of sediment; smelt fetid like the scowerings of a gun; had the flavour of lac sulphuris; and was bitter in the throat. . . . The salt of Upminster is chiefly a calcarious nitre, mixed with a little natron of marine salt."

Morant, writing in 1768, declares[29] that the water of the spring is

"impregnated with alkaline salts [and is] of the same nature as that at Brentwood. It is good to correct acidities, and in vomitings, reachings, and too-copious hæmorrhoidal fluxes."

Trinder, writing some fifteen years later, in 1783, says[30] it

"has the taste of a weak solution of the Epsom Salt in water, but more earthy. It is somewhat turbid and its colour is greenish."

He then details the result of seventeen experiments on the water, and declares[31] that it is

"impregnated with the sal catharticum amarum and with an absorbent earth. Its cooling, alterative, and purgative quality cannot be enough recommended to patients of choleric and adust habits. An habitual costiveness hath been known to give way to it; and I recommended the whey made from this water to an hectically-disposed patient, who found wonderful relief from its use. . . .

"After hard drinking, this water will be found very pleasant and wholesome; and, if the Bacchanalian were wise, it might possibly rescue him from those very disagreeable consequences that usually attend a life of intemperance. . . .

"The virtue of this water extends also to the urinary passages, which it must powerfully cleanse and cool [and so on]."

Mr. T. L. Wilson, the historian of Upminster, says[32] :—

"This spring was cleaned out and enclosed in 1734 by Champion Branfill, Esq., of Upminster Hall, Lord of the Manor in which the spring was situate,

26 *Mineral Waters of Gt. Brit.*, p. 18 (1711).

27 See *ante*, p. 13.

28 *Methodical Synopsis*, pp. 124-125 (1757).

29 *Hist. of Essex*, i., p. 10 (1768). Both the "Gentleman" (*Hist. of Essex*, iv., p. 381: 1771) and Hughson (*London*, vi., p. 201 : 1809) follow Morant almost verbally.

30 *Medicinal Waters in Essex*, p. 35 (1783).

31 *Op. cit.*, pp. 38-39.

32 *Hist. and Topogr. of Upminster*, 2nd ed., pp. 19-20 (1880-81).

and was kept so for some years. A writer, speaking of this spring in 1834, 100 years after it was enclosed, says 'many persons now living recollect its being enclosed, but it is now unenclosed and nearly filled with mud, which, and the water, are both of a most nauseous smell, but tasteless. Some bricks lately taken out are turned black to the middle of them. The smell strongly resembles that issuing from a smith's trough in which hot iron is plunged. This, probably, is testimony to its mineral qualities.'

"No doubt it [the water] is highly purgative and diuretic, as it contains sulphate of magnesia and muriate of soda, but it has never been properly analysed. Had the locality been in its favour and patrons been found, it might, with a little skill, have proven as efficacious as any celebrated spring. It is now a somewhat difficult job to find it, though still in existence."

At the present day, the well, though totally neglected for its mineral and medicinal properties, is well-preserved and protected by a triangular wooden fence (fig. 2).[32a] This is said[33]

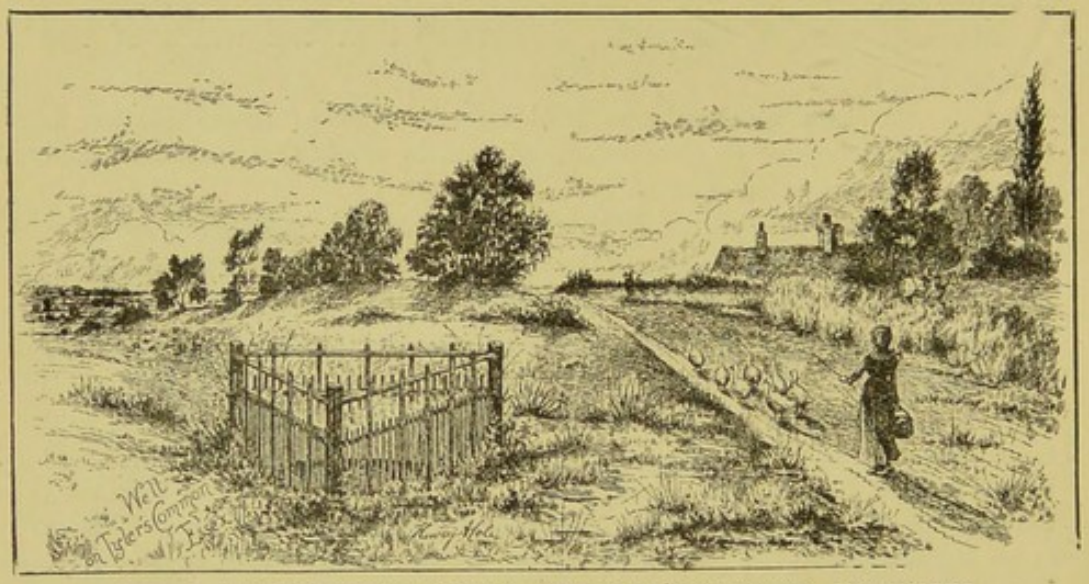

FIG. 2—THE MINERAL SPRING ON TYLER'S COMMON, UPMINSTER
(from a drawing by H. A. Cole).

to have been erected about 1886 by Mr. Champion Branfill (the sixth of that name to own the well), of Martyns, Upminster, but was probably in part a renewal of the fencing erected in 1734 by Mr. Champion Branfill (the first of that name).

Mr. Walter Crouch, F.Z.S., of Wanstead, who visited the well on 21st June 1890, in company with Messrs. William and H. A. Cole, writes[34] :—

"Pieces of the dried earth—a kind of iron clay—which was . . . thrown

32a The well is shown, though not named, on Chapman and André's Map of Essex (1777) but is neither shown nor named on the 6-inch Ordnance Map.

33 See Mr. W. Crouch, in *Essex Nat.*, iv., p. 196 (1890).

34 *Essex Nat.*, iv., p. 196 (1890).

out [when the well was fenced about 1886] may still be picked up ; and, on breaking a lump, the tiny clusters of white crystals may be seen, embedded in the red clay, consisting, probably, of sulphates of magnesia and lime. . . .

" The . . . well, which is somewhat obscured by grass and weeds, is about four feet in diameter. The depth, from the surface of water to bottom, was then five feet nine inches. The temperature of the air being then 68°, the surface water was 58°, and the bottom ranging from 53° to 54°.

" We took samples of the surface water in its undisturbed state, which tasted of iron, but not very strong or unpalatable. The water obtained from the bottom was, however, very strong to the smell."

The bricking of the well is still sound, though much overgrown by grass and brambles. The spring appears to be what Allen calls a " standing " spring, and there is no sign that water from it ever overflows and runs away. A sample of the water, obtained on 18th April 1907 (when the surface was about a foot below the level of the ground surface, which seems to be its normal height), yielded the following results :—

Calcium carbonate	30·8	parts per	100,000
Calcium sulphate	89·8	,, ,,	,,
Magnesium sulphate..	129·4	,, ,,	,,
Sodium sulphate	13·9	,, ,,	,,
Sodium chloride	15·2	,, ,,	,,
Water of hydration	19·4	,, ,,	,,
Nitrates, silica, etc.	0·5	,, ,,	,,
Total solids	299·0	,, ,,	,,

This also may be regarded as a genuine mineral water. It is of much the same character as the foregoing (Weald) water and contains, like it, much less sodium chloride than the Hockley Spa water.

Mr. Dalton supposes that it comes from a low horizon in the London Clay.

(4).—*Witham Spa.*—The well here seems to have been first discovered (as will be seen from what follows) in or about the year 1695. Its water must have been examined almost immediately after by Dr. Benjamin Allen, who discussed it in his book published in 1699. Speaking of it as " The Water at Witham, in Essex, in Sir Edward Southcot's ground,"[35] and classing it among " Chalybeat waters that contain a nitrous salt," he says[36] that it turns,

" with gall, a deep purple, turning to ink, not very clear ; and, with Lignum

35 Sir Edward Southcott, Knight, of Witham Place, was the eldest son of John Southcott, Esq., of the same place. Sir Edward, who was twice married, died in 1751.

36 *Chalybeat and Purging Waters*, p. 19 (1699).

Nephriticum, a faint dull reddish. I judged this to have more of the nature of the salt of common water and that the spirit of this water to be a little finer than the other sort [viz., that at Leez], which give a direct black with gall, because distill'd acids give this red. The red that alkalys give turns greenish upon standing. These waters are all inclin'd to the same."

Evidently, however, Allen did not think much of the curative value of this water; for, from his second book, published in 1711, he omits his detailed account of it, because, he says,[37] such small springs are endless in number. At this time, indeed, the well had fallen into disrepute, from which it did not recover till about a quarter of a century later, when a new well was dug and Dr. James Taverner, physician, of Witham, published a detailed account of it. Taverner says[38]:—

"The spring was first discovered about forty years ago [say, in 1695]. But, by digging the well too near the verge of the mineral stratum, and where it was extremely thin; by making the reservoir too large; and by admitting into it, through inadvertence, a spring of common fresh water, the spa soon lost its reputation (for it had been much esteemed, even before it was formed into a regular well) and by degrees grew into disrepute. It had been, for several years, entirely neglected; but, in the year 1736, was again revived; and, by carefully avoiding those mistakes which evidently occasioned the ruin of the former well, it is now fixed to a much better advantage."

Continuing as to the history of the well, Taverner says[39]:—

"The spring-head lies near twelve feet lower than the surface of the ground that immediately surrounds it. . . .

"In digging for this mineral spring [? in 1736], the following strata of the earth were observable:—First, the common earth or corn-mould; next, a strong loam, about four feet in thickness; then, the same loam, mixt with gravel, about three feet; after this, common gravel, likewise about three feet deep; then, a thin tough variegated stratum, composed of several *lamellæ* of different colours, as brown, reddish-brown, yellow, blue. This stratum, when first taken up, emits an exceeding strong and stinking smell of sulphur and iron; and, when fresh, being infused in common water, communicates to it a ferruineous taste and smell, as, likewise, the power of tinging with galls; but the stratum, in less than twenty-four hours, loses its sulphurous smell, as well as its power of imparting its chalybeate properties to common water. This stratum is about two inches in thickness and separates the common gravel from that wherein the spring rises, which is a blueish gravel, mixed with sand and an infinite number of small white stones. This last gravelly stratum likewise smells strongly of sulphur and iron, and is of an uncertain thickness. In digging the last mineral well, it was penetrated above four feet, but the bottom of it was not found. . . .

"The two most remarkable substances amongst which the mineral water arises are the iron-stones, found in great plenty amongst the gravel where the spring first shows itself, and the thin variegated stratum before spoken of.

37 *Mineral Waters*, Epistle Prefatory, fo. c4, obv. (1711).
38 *Essay on Witham Spa*, p. 3 (1737).
39 *Op. cit.*, pp. 3-6.

"These mineral stones are found of several colours, as green, grey, blue, white. Upon experiment, they appear to contain iron, sulphur, salt, and a considerable quantity of an earthy or stony matter. Some of them, especially the blueish sort, are so rich in iron that, being only powdered and applied to the magnet, without any previous calcination, many particles thereof are readily and briskly attracted by it.

"The variegated stratum contains iron, sulphur, marine salt, nitre, and a large proportion of a smooth bolar earth."

Mr. Dalton, criticising the foregoing statement, writes:—"The water came, no doubt, from the Glacial Gravel or, possibly, from the River-gravel of the Blackwater. The London Clay is immediately below. A bed of clay derived from the London Clay, with little or no alteration or admixture, seems to divide the gravel into an upper layer of oxidised 'common' gravel and a lower layer of blue and sulphurous gravel. It is not impossible that this bed of clay marks the junction of the glacial and post-glacial deposits, here over-lapping with undefinable limit. The injudicious digging alluded to above probably admitted water from the river-gravel, causing dilution of a true 'mineral' water previously impregnated with carbonate of iron from pyrites (the 'iron-stones' spoken of by Taverner) and derived from the Glacial Gravel."

Taverner next turns to the nature of the water:—

"The spring rises perpendicularly [he says[40]] into a small receptacle and is brought up by a pump; the water, when fresh, being perfectly limpid and clear. It has a very strong ferrugineous smell and taste; and, though it wants that peculiar brisk and picquant taste from whence, perhaps, chalybeate waters might obtain the appellation of Acidulæ, yet it is not destitute of a spirit, which manifests itself in a certain remarkable freshness and makes the water very agreeable to the palate and stomach, as the loss of it [*i.e.*, of the "spirit"] renders it disagreeable to both. It has, besides, a particular taste—much easier distinguished by the palate than described—proceeding, probably, from the salts or sulphur it contains, or being, perhaps, the joint effect of both. If suffered to stand some time exposed to the air, it grows vapid and milky; a variegated scum arises upon its surface; and, at length, depositing a brownish sedement, it loses its chalybeate taste and its power of tinging with galls."

Thus far as to the well itself and the appearance of the water it supplied. Taverner next discusses at great length the chemical nature of the water. Thus, Chapter IV. describes[41] in great detail fourteen "Experiments" he made to test its properties. In Chapters V. to IX., these Experiments are discussed exhaustively.[42] Chapter V. deals with the water in general; Chapter VI.,

40 *Essay*, pp. 7-8.
41 *Op. cit.*, pp. 8-19.
42 *Op. cit.*, pp. 20-58.

the "mineral spirit" contained in the water; Chapter VII., the sulphur; Chapter VIII., the salts; and Chapter IX., the "alcaline earth." Chapter X.[43] contains the conclusions arrived at, which are that

"the Witham Spa is a sulphureous chalybeate water, impregnated with a small quantity of salts, but carrying in it a larger proportion of an alcaline earth; that its virtues, therefore, are not only conformable to those of its several ingredients, but may, likewise, and do, many of them, result from the mixture and united virtues of the whole.

"As a chalybeate, it quickens the whole circulation, attenuates the blood, dissolves viscid humours, [and] opens obstructions; after which, by its austere and styptick quality, it streightens[43a] the relaxed fibres, recovers the lost tone of the solids and restores their due elasticity.

"As a sulphureous water, it is, likewise, attenuating, resolving, dessicative, balsamick, pectoral, vulnerary, and antiscorbutick.

"From its salts, it incides, stimulates, dissolves, sizy humours, promotes the several secretions, and is, in particular, very diuretick.

"Its smooth and subtle alcaline earth is absorbent, destroys acids, and blunts the acrimony of sharp humours. And the mineral spirit not only preserves, by its activity, the due mixture of the several ingredients in the water, but likewise raises the animal spirits and diffuses new life and vigour thro' the whole œconomy.

"The chalybeate, however, in our mineral water, is not to be considered as a mere chalybeate and nothing more, but as a chalybeate prepared with sulphur; whereby the body of the iron is more opened and subtilized and, consequently, enabled to penetrate farther into the habit than it could otherwise do. This sulphur (which is, in its own nature, heating) is allay'd and qualified by the cooling property of the nitre. The nitre (which, of itself, is too soft to stimulate the vessels enough to fuse the viscid humours and duly to promote the excretion of urine) has a stimulating power communicated to it by the marine salt. And the acrimony of the marine salt is sufficiently corrected by the alcaline earth; whilst the energy of the whole is enforced by the powerful influence and activity of the mineral spirit.

"Thus do these several principles conspire in forming a most useful composition, and from their union results this most excellent mineral water, whose singular virtues and efficacy will render it beneficial in many, if not in most, chronic diseases incident to mankind."

One cannot help wondering if the writer was able to persuade himself that he really understood what he had written!

Elsewhere, Taverner informs[44] us that, in carrying out his experiments on the water, he had been greatly indebted to his friend, "the ingenious Dr. Legge, of Braintree."[45] He next excuses himself for not adding "some histories of cases wherein

43 *Op. cit.*, pp. 58-60.

43a ? strengthens

44 *Op. cit.*, Preface, [p. v.].

45 We can learn nothing as to the identity of this gentleman.

our mineral water has proved successful"; because, he says, "the water is yet but in its infancy and examples of its good effects will be continually multiplying." Finally, he promises his readers that, if his *Essay* should meet with general approval, he would publish later "a further account of the virtues and efficacy of this mineral water." Meanwhile, he assures his readers[46] that,

"in hectick fevers, in constitutions debilitated by long illnesses, in lowness of spirits from a general relaxation of the solids, in weakness of the nerves, in want of appetite and indigestion, in habitual colick and vomiting, in obstructions of several kinds, in agues, in the jaundice and beginning dropsy, in nephritick disorders, in some asthmatick and several scorbutick cases, and many others, too tedious to mention here, the Witham Spa has been already used with great benefit and success.

"But [he continues] what makes it of less general use is that the mineral spirit is of so exceeding volatile a nature as to make its escape upon carriage, tho' the bottles are ever so carefully corked and cemented; whence it becomes necessary for those who would drink it to advantage to come to the spring and take it upon the spot."

Fortunate physician! Possessed of a remedy with all the wide virtues of a modern patent medicine, yet incapable of transport, so that all sufferers had to come to him in person for cure!

The discovery (or, rather, re-discovery) of this Medicinal Spring raised high hopes that the town of Witham would become very prosperous by reason of the influx of visitors desiring to drink the waters, and great efforts were made (probably at the expense of Sir Edward Southcott) to establish it as a regular "Spa" or health resort. A house, now known as "Spa Place," was built by the adjacent roadside, about one hundred yards from and overlooking the well, being intended probably to accommodate a resident physician and his patients. Morant says[47] that "the Great Hall at New Hall [Boreham] was bought and translated here for an Assembly Room." This must have been soon after 1737, when Benjamin Hoare sold the palace of New Hall to John Olmius (afterwards first Lord Waltham), who, as Morant says,[48] pulled down part "of that overgrown edifice, reserving enough for a handsome and convenient seat for his own use." It is hard, however, to see how the Great Hall of the palace (which was of brick) can

46 *Op. cit.* preface, [pp. vi.-vii.]
47 *Hist. of Essex*, ii., p. 112 (1768).
48 *Op. cit.*, ii., p. 15.

have been "translated" six or seven miles and re-erected at Witham. Probably Morant means that the bricks (and, perhaps, the timbers of the roof) were removed and that some new building, intended as an Assembly Room, was constructed out of them ; but, even so, there is nothing to show either where this building stood or what has become of it—for it does not now exist. However this may be explained, Morant adds that "the whole project soon came to nothing."

The prospects of the Spa seem, however, to have revived again later ; for, in 1783, Trinder wrote of it as though its water was then valued. As a result of fourteen experimental tests, he describes[49] the water as—

"a brisk chalybeate and impregnated with a little sulphur and magnesia glauber's salt ; but [he adds] the purgative water is so small in proportion to its other ingredients that it will only tend to keep the body in due order, without enfeebling it by excessive evacuations. . . . This water has, with reason, been long famous [he continues] for its power in strengthening constitutions that have been weakened by long illness."

He cites also the cases of Mrs. Sly and Mrs. Bull, both of Witham, who were cured of illnesses which would have proved fatal but for the use of this water. Of the water itself, Trinder says[50] that

"It is perfectly clear and limpid ; it has a ferruginous taste; and it possesses, at the spring head, a certain freshness which renders it agreeable to the palate and stomach."

Further, in 1803, a local topographer was able to write[51] that "the chief trade of Witham arises from the passage of travellers and carriers and, in the summer season, from the company who attend to drink the chalybeate waters at Witham Spa."

Since this time, however, the Spa has entirely lost its repute and is now all but forgotten locally.

In regard to the position of the well, Taverner says[52]:—

"The Spa . . . is three quarters of a mile distant from the town. It arises on the side of a gentle ascent and close to a fine avenue of lime-trees, which extends from Witham Place, the seat of Sir Edward Southcott, to the road leading to Falkbourne, being near half-a-mile in length."

With this and local tradition to guide us, and with the assistance of the Rev. Canon Ingles, Vicar of Witham, we are able to identify with confidence the site of the well, though the well itself no longer exists.

49 *Medicinal Waters in Essex*, pp. 44-45 (1783).
50 *Op. cit.*, p. 41.
51 *Beauties of Engl. and Wales*, v., p. 282 (1803).
52 *Essay*, pp. 2-3 (1737).

The well was about one hundred yards from, and in front of, the present Spa Place, lying in a meadow on the northern slope of the valley of a tiny rivulet which runs down into the Blackwater River. Its site is, as Taverner says, close to the fine avenue of limes which led formerly from Witham Place towards Faulkbourne. Although the greater part of this avenue has now disappeared, like Witham Place itself, a considerable portion of what was the western end remains, and the site of the well was about a dozen yards to the south-east of the eastern-most tree now standing. Here a very slight depression in the turf, about five feet across and scarcely noticeable unless pointed out, was shown to Mr. Christy as the site of the well, by Mr. Quilter, who lives close at hand, and his statement was confirmed by several elderly neighbours of his, though none could speak positively. Since then, however, Canon Ingles has been informed by a very old woman named Brown, living in Church Street, that she can remember dancing, in her young days, on the wooden trap which then covered the well, and that it was at the spot in question. She adds that the well has since been closed by a dome of brickwork, over which turf has been laid.[53]

We remain in doubt, therefore, as to the precise chemical constituents which gave the water the curative value claimed for it.

(5).—*The Little Leighs (or "Leez") Spring.*—This small and comparatively-unimportant spring is first mentioned in 1699 by Allen, who was clearly the discoverer of it. He speaks of it[54] as "A water in a field adjoyning to the Right Honourable the Earl of Manchester's Place, at Leez, in Essex,"[55] and classes it among "chalybeat waters that contain a nitrous salt." He says that the spring

"is in a gravel and is so small as to be considerable only that it is in a breeding pond. This water disturbs not a solution of sublimate in fair water. It render'd milky a solution of Sal Saturni, by which it distinguish'd itself from saltpetre, but yet not more than saltpetre's second salt does. With Lignum Nephriticum, it gave a pale yellow, and not fine, exactly the colour of small beer; which, at four day's end, precipitated, so as to leave just the top of the liquor clear. The water kept till it had lost its spirit and, with that, its power

53 Further, the spot is marked on the 6-inch Ordnance Map as the "Site of Witham Spa."

54 *Chalybeat and Purging Waters*, pp. 18-19 (1699).

55 The Montagus, Earls and (after 1719) Dukes of Manchester, inherited Leez Priory from the Richs, Earls of Warwick, but lived there very little, preferring Kimbolton. In 1699, the Priory belonged to Charles, the fourth Earl, to whom Allen's book is dedicated. It fell to decay and was greatly reduced in size during the Eighteenth Century.

of striking black with gall (which was 24 hours). Essay'd with gall, [it] was thick and dirty white, which precipitated in the former experiment, shewing an affinity with common salt, in this with nitrous. It is much of the weight of common water, and takes a blew black with galls."[56]

Allen omits the foregoing from his second edition of 1711, because, he says,[57] such small and unimportant mineral springs were endless in number.

Monro refers to this spring,[58] but gives no additional information in regard to it, and we believe no later writer notices it.

We have been unable to identify this spring, but Mr. Dalton surmises that its water came, in any case, from the Glacial Gravel, close to its junction with the London Clay.

(6).—*The "Felstead" (i.e., Little Dunmow) Well.*—Another small spring, first discovered by Allen and recorded by him in 1699, is in the parish of Little Dunmow, though very close to the border of Felstead parish and not far from the village: hence, it has been spoken of as the "Felstead" spring by Allen and most other writers.

Allen classes the water as "purely chalybeat"[59] (that is to say, it contained no salts of nitre) and he says of it:—

"This water lies in a moor,[60] the bottom whereof is a cemented rock.[61] The earth where the spring rises is fat and bituminous or unctuous and very ferrugineous. [There is] no incrustation in the boggy hole where the water stands, but the water that passes through the meadow begins to incrust as it touches this ground. It is of the same weight exactly with Tunbridge [Water]. It becomes milky with a solution of Sal Saturni, and with Lignum Nephriticum suffer'd no stain, but only a milky cloud swimming in it. This is but a small spring, scarce more than a land-drain."

In his second edition of 1711, Allen does not describe this spring separately, because, as he says, such small chalybeate springs are very numerous; but he refers to it in three places,[62] in one of which he says:—

"I had the success of curing a young gentleman of the same stoppages just now mention'd, suppos'd to be a phthisis, by a small ousing spring at Felsted, which I chose by the taste, lightness, and rocky cements, on which I ventured to recommend it."

56 The closing sentences are obscure, apparently through some error in punctuation, which we have endeavoured to amend.

57 *Mineral Waters*, pref., fo. c4, obv. (1711).

58 *Treatise*, i., pp. 268 and 384 (1770).

59 *Chalybeat and Purging Waters*, p. 28 (1699).

60 He means, no doubt, a bog.

61 Mr. Dalton suggests that by this he means iron conglomerate, with or without calc-tufa.

62 *Mineral Waters*, pp. 28, 30, and 58 (1711).

Monro also refers to the spring;[63] but, as usual, he gives no new information regarding it.

Trinder, writing of it in 1783 as "Little Dunmow Water," says[64]:—"Its taste is ferruginous; it is not turbid; and there is much red ochreous earth about it." After stating the results of twelve experimental tests—evidently made by himself on the spot—he declares[65] that

"This comparatively light and pure chalybeate water, from its being so little loaded with matter, should be drank at the fountain head. It greatly resembles the Tunbridge water and exceeds it in lightness; and, therefore, it highly deserves the attention of its neighbourhood. . . .

Persons who are apopletic and who are subject to convulsive diseases . . . will find great relief from this water, for it will act as an active and universal tonic, . . .

Mr. John French, of Waltham Cross, whose knowledge of the natural features of the Felstead district is unsurpassed, writes to us as follows:—

"The chalybeate spring at 'Felstead' is situate about a furlong south-east from Felstead Railway Station. It has probably been known and frequented since a very early period. The remains of a Roman villa or habitation were found on the site of the station. In later times, the spring seems to have been frequented by the monks of Little Dunmow Priory; for a foot-path, not otherwise explainable, leads direct across the fields from the Priory to the spring. Formerly, the spring was actually by the roadside; but, under some Enclosure Act of about the year 1860, the roadside waste was enclosed, though a small path to the spring was left. This has been closed recently.

"The water of the spring has a peculiar taste, but it is wholesome and is still believed locally to possess medicinal properties. It must flow from the surface of the London Clay, which contains abundance of pyrites and of sulphuric acid, both of which will be found, I think, to enter into the composition of the water.

"I have, I admit, no actual roof that the spring I speak of is that mentioned by Allen, but I am morally certain that it was no other. There are many other springs at Felstead, but not

63 *Treatise*, i., p. 269 (1770).
64 *Medicinal Waters in Essex*, p. 53 (1783).
65 *Op. cit.*, pp. 55-56.

one of them has the slightest claim to be regarded as a 'Mineral Spring'; whereas I can prove that the reputation of this particular spring has been maintained almost since the time when Allen wrote. My most reliable informant was an old man, long since dead, who was born about 1800. He told me many times that the spring was in high repute when he was a boy and that he had been told it was equally famous many years earlier. This would take us back into the reign of George II."

FIG. 3.—THE MINERAL SPRING AT LITTLE DUNMOW ("FELSTEAD")
(from a photograph by Miller Christy).

The spring is on the east side of the road leading from Felstead Station (which is in Little Dunmow parish) to Felstead village and about one hundred and fifty yards from the station. It is now actually in the garden of Priory Lodge (belonging to Hastings Worrin, Esq.), having been taken in some years ago, with the strip of road-side waste on which it rises. Its sides have been bricked and are surrounded by growing ferns and other greenery (fig. 3).[65a] The water tastes very markedly of iron,

65a It is shown as "Spring" on the 6-inch Ordnance Map.

but is not in any way disagreeable, and is used regularly for domestic purposes by the occupants of an adjacent cottage. A sample obtained in July 1907 yielded the following results:—

Calcium carbonate	.. .. ..	28·0	parts per 100,000
Calcium sulphate	.. .. ..	12·9	,, ,, ,,
Magnesium sulphate	.. ..	3·51	,, ,, ,,
Sodium sulphate	.. .. ..	2·2	,, ,, ,,
Sodium chloride	.. .. ..	3·9	,, ,, ,,
Sodium nitrate	.. .. ..	0·96	,, ,, ,,
Ferrous carbonate	.. .. ..	0·1	,, ,, ,,
Silica, etc.	.. ..	1·43	,, ,, ,,
Total solids	.. ..	53·00	,, ,, ,,

This is apparently an ordinary Boulder-clay water. The fact that this clay contains much chalk accounts for the large amount of calcium carbonate present. The Boulder-clay is not far away, and probably a strip or outlier of it extends to the vicinity of the well. In any case, this water resembles others from the Boulder-clay. There is just enough iron to give the water a marked chalybeate taste, but not enough to give it any medicinal value.

Mr. Dalton writes, however, that:—"The site of this spring is mapped as London Clay, some distance below the Glacial Gravel, and beyond reach of any infiltration of drainage from the Boulder-clay. It may obtain its carbonate of lime from the London Clay *septaria*."

(7.)—*The Mark's Hall Spring.*—Another small and unimportant spring, discovered and first recorded in 1699 by Allen,[66] lay somewhere in the parish of Mark's Hall, some six miles and a half east-north-east from Braintree. He classes it as a "Chalybeat-water containing a nitrous salt," and says:—

"This water, joyning another, incrusts, as do the rest. It is much the same with the preceding [i.e. Knaresborough], containing little steel, but a large share of an acid, not so fugitive as where it is in less quantity or ill-coupled. With a salt, it gave a bright red, a very little purplish, not so deep as the preceding. The colour it advanc'd with gall, it lost again two days after, without precipitation of any ferrugineous parts, in which it differs from other chalybeats. It rendered a solution of sal saturni troubled, but not very milky, much as the rest; and it tinctur'd a high yellow with Lignum Nephriticum, as do nitres, and a little clouded. It weighed, likewise, as the other, just the weight of common water."

66 *Chalybeat and Purging Waters*, p. 21 (1699). It appears not to be noticed in Allen's second edition (1711).

Monro refers[67] to this spring; but, as usual, he merely retails in abridged form the information given by Allen.

Mr. Dalton writes that, in the absence of evidence as to the exact position of the well, one may surmise that the water came from the base of the Glacial-gravel on the west side of Mark's Hall Park.

(8).—*The Woodham Ferrers Spring.*—Another mineral spring first recorded by Allen in 1699 (and, no doubt, discovered by him) was in the parish of Woodham Ferrers, which lies about 15 miles south-south-west from Braintree and seven south-west from Chelmsford. He speaks[68] of it as a "Chalybeat Purging Water," and says :—

"The earth cast out of this well contain'd many discolour'd parcels of mellower earth, the colours of which were two—that of brimstone and a ferrugineous—and which yielded iron upon essay, when only well wash'd. And, as at Epsam, these veins attend the Selenites, so the same stone is plentifully found here. Most of them were in one half, resembling the rhomboid : the other [sort] had a differing figure [caused] by the declining of the two opposite grand planes till they determin'd at an edge, which was semi-circular, as in the figure.[69] In parcels of this loam inclos'd, I found great plenty of vermicular bodies which were mere iron ; of which metal, one Tubulus Marinus and several pieces I brought away with me and reserve. The stone or imperfect marcassite, which I call Lapis Lutoso-vitriolicus here, had many shining particles in it, and consisted of parcels divided by a thin wall of gypsum or trichitis and precipitated some iron when dissolved in aqua fortis and diluted with fair water.

"The water was clear, of taste chalybeat, but had more of the nauseous sweetish taste of chalybeate waters not devoid of bitterness."

He proceeds to detail at length how the water behaved when treated with various chemicals and when boiled.

In his second book (1711), Allen says[70] :—

"This spring is of the level kind, being a well in a plain ground. The soil, lays, and stones are before described ;[71] only I may add that I found, in the clay cast out, several vermicular bodies, of the bigness of a pretty large wire, some almost straight or turned a little as a worm lies, and one Tubulus marinus, being involuted, all of iron. This spring had a disadvantage in its standing.[72] By want of air, passage, and frequent emptying, it is liable to be corrupt and feted ; which, otherwise, it is not, and might be of good use."

In the engraved plate prefixed to his second work, Allen

67 *Treatise*, i., p. 268 (1770).
68 *Chalybeat and Purging Waters*, pp. 158-160 (1699).
69 The figure is missing from the copy to which we have had access.
70 *Nat. Hist. of Mineral Waters*, p. 35 (1711).
71 He means in his first book (see above).
72 He means, apparently, that it was not a running spring.

figures the "*Tubulus marinus*" and also one of the crystals of the salt contained in the water.[72a]

Mr. Dalton suggests that the spring rose in the London Clay containing marcasite (pyrites) and selenite.

(9).—*The Colchester Spring.*—The last of the small Mineral Springs mentioned by Allen in 1699 was at Colchester. He says it was at "the North End" of the town, but gives no more detailed clue as to its exact locality. He classes it as yielding a "Purging Water," and adds[73] that it

"boyl'd meat without discolouring the flesh, which it rather whiten'd. The water was much the same with Acton [Water], giving, with tincture of logwood, a purplish red, a little tawny; and, with gall, a clear yellow and pale; but, in half an hour, grew turbid, with a whitish cloud. But, with Lignum Nephriticum, it became a little darkish, but clear, a little toward what spirit of vitriol does."

Mr. Dalton writes that the water came presumedly from the London Clay slope on the north side of the Colne, with a trace of the sulphates of magnesia and lime and possibly some free sulphuric acid. The absence of iron is due probably to complete peroxidation and consequent precipitation.

It will be convenient to notice, in the next place, an Essex Spring—that at Woodford—which appears to have been first brought into notice by the publication, in 1711, of Dr. Benjamin Allen's second work, namely:—

(10).—*The Woodford Wells.*—Allen says[74] of the water of this spring that, "In the quantity of ten ounces and a half (within a few grains), it weighed 29 grains more than common water, after a dry year (1702)." He next details the results of his various experiments upon the water, which he classes, like that of the Upminster Spring, among "Waters containing a Salt Alkalial, resembling Salt of Tartar, and the Sulphurous Salt of Vegetables."

As to this spring in its palmy days, singularly little information seems to be obtainable. Yet it certainly enjoyed, at one time, a certain measure of fame. Morant, writing in 1768, says[75] that "Woodford Wells were formerly in repute as purgative and

72a The "*Tubulus marinus*" appears to have been an example of *Planorbis spirorbis* which had become encrusted with iron: the crystals are apparently those of selenite.

73 *Chalybeat and Purging Waters*, p. 128 (1699). Apparently Allen does not mention it in his second edition (1711).

74 *Mineral Waters*, pp. 19-20 (1711).

75 *Hist. of Essex*, i., p. 39 (1768).

good for many illnesses." In this, he is supported by Ogborne[76] and other county historians. Moreover, the well or wells gave name to that part of the parish of Woodford in which they were situated,[77] as well as to a well-known inn called "The Horse and Well," which stood (and still stands) adjacent to them, on the High Road from London to Epping and Harlow. Hood alluded, of course, to this house when he wrote,[78] in 1829, of the adventures of John Huggins with the Epping Hunt :—

"Now many a sign at Woodford Town
Its Inn-vitation tells ;
But Huggins, full of ills, of course,
Betook him to the Wells."

The days when the Woodford Wells were in good repute seem, however, to have been brief. Morant, writing in 1768, says[79] that they were then "entirely neglected," and they have never since enjoyed fame.

At the present day, it is difficult (and probably impossible) to identify the particular well the water of which was reputed to possess medicinal properties. The most definite clue appears to be that given by Lysons, who, writing in 1796, says[80] that the well was "near the nine-mile stone, in the Forest," which then came, we believe, right up to the east side of the road. It must also have been, one would think, close to the "Horse and Well" inn, which is on the east side of the main road, about one hundred yards north from the 9-mile stone (or, rather, from its site, for the stone itself has disappeared). As a matter of fact, a drinking-fountain stands almost opposite the inn ; but this is, we understand, a modern erection, placed in position by Mr. E. N. Buxton and supplied from the mains of a water-company. There are also other wells close to the inn, but these are all by the roadside and could not be described as "in the Forest." On the 25-inch Ordnance Map, the "Supposed Situation of the Mineral Springs known as 'Woodford Wells'" is shown as a hollow place (whence, we are told, clay has been dug for brick-making) in the sloping meadow to the north of the "Horse and Well" and behind Nottingham Villas. The spot in question is about one hundred yards to the east of the road,

76 *Hist. of Essex*, p. 74 (1814).
77 In 1875, the ecclesiastical parish of Woodford Wells was formed out of the civil parish.
78 *The Epping Hunt*, p. 26 (1829).
79 *Hist. of Essex*, iv., p. 39 (1768).
80 *Environs*, iv., p. 287 (1796).

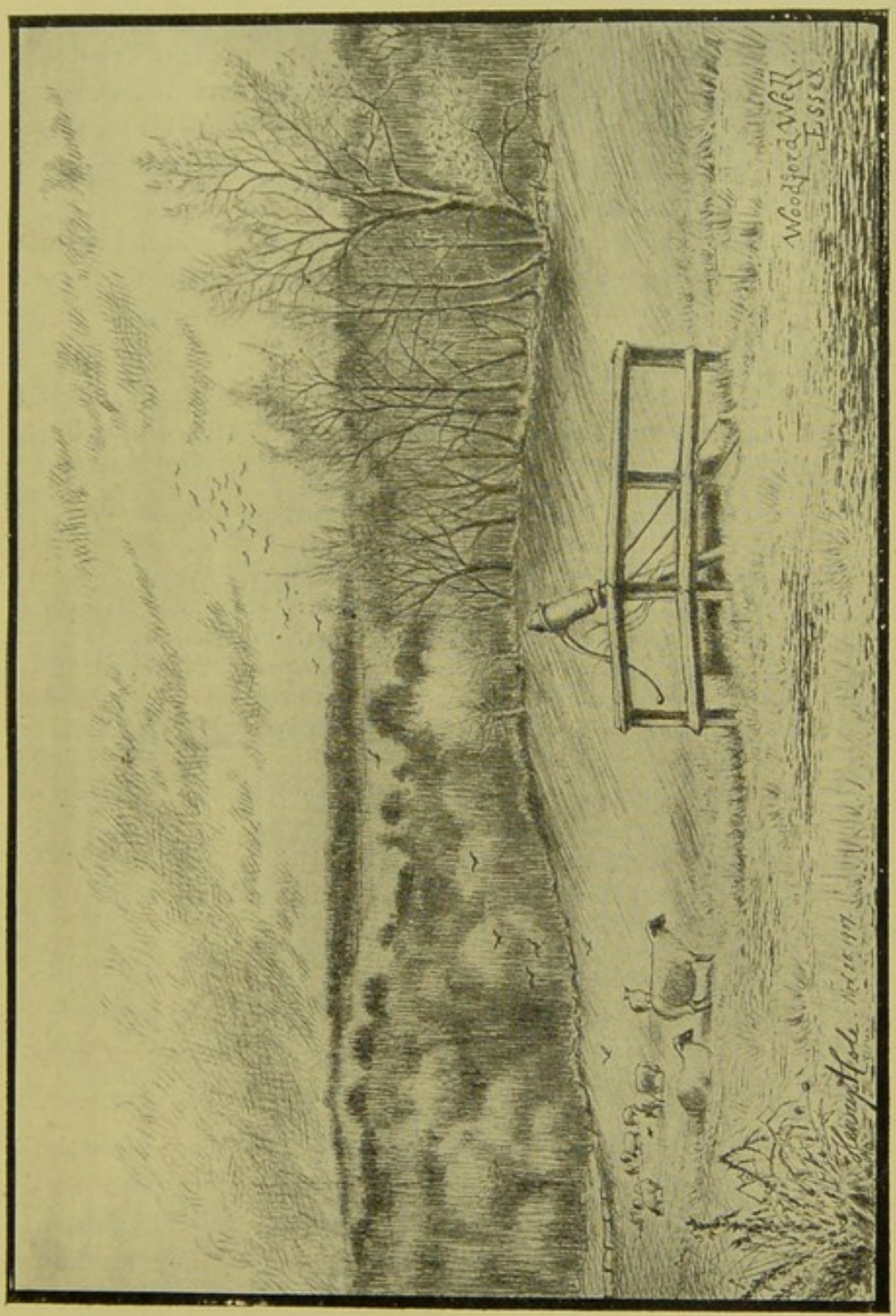

FIG 4.—THE SUPPOSED MINERAL WELL AT WOODFORD WELLS
(from a drawing by Mr. H. A. Cole.)

but there is no spring or running well there now. While this may very well have been the site, there is another well still nearer to the nine-mile stone—namely, in the middle of a meadow belonging to Mr. Buxton and adjoining the present cricket ground. For our knowledge of it, we are indebted to Mr. B. G. Cole, who has been kind enough to make many enquiries on the spot. The well in question (fig. 4) is about two hundred yards to the east of the road and is furnished with a pump. It is a dug well about 4 feet in diameter, bricked round with small bricks which look (as far as one can see) very old. When Mr. Christy visited it in company with the Messrs. Cole on the 13th November 1907, there was 4ft. 3ins. of water in it and the surface of the water was 6ft. below the surface of the ground. A sample of the water brought up yielded the following results :—

Calcium carbonate..	1·66 parts per 100,000
Calcium sulphate	8·29 ,, ,, ,,
Magnesium sulphate	5·40 ,, ,, ,,
Sodium sulphate	1·55 ,, ,, ,,
Sodium chloride	3·30 ,, ,, ,,
Sodium nitrate	1·78 ,, ,, ,,
Iron	(A minute trace)
Silica, etc.	1·02 parts per ,,
Total solids.. ..	23·00 ,, ,, ,,

There appears to be nothing to justify the opinion that this water has medicinal properties. The trace of iron is not sufficient even to impart a chalybeate taste.

Mr. Dalton writes that the water in question comes, doubtless, from the base of one of the several patches of Glacial Gravel capping the ridge of London Clay between the Roding and the Ching.

(11.)—*The West Tilbury Wells.*—About fifteen years after the publication (in 1711) of Allen's second work, there was discovered at West Tilbury, on the north bank of the Thames, a medicinal well which afterwards became famous—more so than any other of our Essex wells. It retained its fame, too, for a longer period than any other Essex well. It appears, indeed, to have been the only one the water of which ever had a real and enduring commercial value. Its history is related very

fully and clearly in a pamphlet by Dr. John Andree, a well-known London physician, which was published in 1739 and went through four later editions—the last appearing in 1781.[81]

Of the well and its origin, Andree says[82] :—

"The spring from whence the Tilbury Water comes is situated near a farm-house at West Tilbury, in Essex, on the top of a hill, which is elevated about one hundred feet above the marshy grounds and is two miles distance from the River of Thames. Mr. Kellaway, deceas'd, the proprietor of that estate,[83] sunk the well, in the year 1724, for the use of the farm, but it was not known for any medicinal vertue till three years after [that is, in 1727]."

Elsewhere, Andree says[84] :—

"The spring is about twelve feet deep from the surface of the ground and rises from a bed of gravel several feet deep, about forty yards from the extreme point of the hill on which it is situated. . . . The water is about two feet and a half deep, and the well, when fullest, contains near a hundred gallons."

The well still exists and can be identified, as will be shown later. For the present, let us revert to the year 1727, when its water was first recognized as of value medicinally. Andree says[85] that

"Mr. Kellaway, being then at his farm, much troubled with the gout and a violent cold, ordered some of the water to be boiled to drink with wine ; and, perceiving it looked white and that it became clear again upon mixing some white-wine with it, he apprehended it was not wholsome to drink. However, the family telling him that they had constantly made use of it on all occasions without any hurt and that it always boil'd white, he drank of it during the time he then stay'd there and found himself chearful and much relieved of his gout and cold. As he was a great lover of milk, he commonly eat some [*sic*] when he was at his farm, tho' it seldom failed to give him some loose stools ; but, one morning, after he had taken a glass of the water, he took some milk and found it did not purge him as usual ; which experiment he made many times after, with the like success.

"No further notice was taken of the well till, in the year 1731, Mr. Kellaway, about that time labouring under a looseness for about fifteen or sixteen days, which had reduc'd him to a very low state, and being oblig'd to go down to Tilbury to look after his farm, he drank some of the water with wine at night. The morning following, he perceiv'd that his looseness was gone and his appetite pretty well restored ; which, for many days before, had intirely failed him.

"This sudden amendment made so strong an impression upon his mind that he ordered the person who look'd after his farm, if he found any of the servants,

81 See *ante*, p. 7.

82 *Account of the Tilbury Water*, 2nd ed., p. 9 (1740)

83 Mr. John Kellaway, who bought West Tilbury Hall from Richard Jenoure, Esq., died 17 Sept. 1737 (See Morant, i., p. 232).

84 *Op. cit.*, 1st ed., p. 4 (1737). The passage is omitted, for some reason, from all subsequent editions.

85 *Op. cit.*, 2nd ed., pp. 9-12. This passage appears in the first edition but, less fully.

day-labourers, or others, afflicted with a looseness, to recommend to them the drinking of that water; which, being done accordingly, they found that it generally answer'd the expectation of those who made use of it.

"After this, another experiment was accidentally hit upon, confirming the water's efficacy in curing diarrhæas, which put this matter beyond all doubt, as it came from the Brute Creation, who have not craft enough to impose on our senses by dissembling. The case was thus:—Mr. Kellaway bred a great number of calves at his farm. To stop the looseness which they are subject to and often proves mortal, the keepers usually made them drink a decoction of oak-bark and water; but, as they knew that the water had cured looseness, they gave it to the calves and found that it made them well, and [the keepers] observ'd, further, that not near so many of them dy'd whilst they drank that water as when the oak-bark drink had been given them.

"A cure which was, about that time, performed upon a neighbour's child, about five years old, who had been, as I was informed, near three years afflicted with an ague, a swelled belly, and a looseness, added considerably to establish the reputation of the well. . . . Mr. Kellaway also observ'd that his asthma was relieved so far that, the last two winters before he died, he was not obliged to lie out of town, as he had been for five winters before, on account of his difficulty of breathing in London; which he attributed to the constant drinking of the water.

"Thus the Tilbury water made its way, by slow and obscure steps, for want of proper assistance to usher it methodically into the world. For, as Mr. Kellaway was not conversant in analysing Mineral Waters and forming a proper judgment from thence of their vertues himself or had not the opportunity of making experiments upon sick persons, he apply'd to some of the Faculty; but, being coldly told that there were more Mineral Waters already in use than are necessary, he declined making any further attempts that way, his business engaging his attention to other affairs, and contented himself with distributing the water *gratis* among his acquaintance in Town, as also to the people at and about Tilbury, who began to drink it for various complaints.

"In the year 1736, the water began to be talk'd of pretty much, on acconnt of its extraordinary vertues, which induced me to make some enquiry about it; and, after Mr. Kellaway had given me the foregoing historical account, and Mr. Deputy P——[86] having assured me that his spouse had been cured by it of an obstinate diarrhæa, after all the advice she had taken had proved ineffectual, and that some of his acquaintance had also experienc'd the same good effect, I undertook to examine the water by various experiments. Mr. White, . . . [late Chemist at Apothecary's Hall], at the request of some Gentlemen of the Royal Society, did the same. . . ."

Andree goes on to state that, on the two comparing notes, they arrived at certain conclusions, which are detailed[87] in the form of eighteen "Experiments," to which Andree afterwards added fifteen more.[88] Describing the water, he says[89] that it

86 Mr. Deputy Pott (the full name appears in the later editions).

87 *Op. cit.*, first ed., pp. 9-13 (1737); second ed., pp. 12-15 (1740); &c.

88 *Op. cit.*, second ed., pp. 15-19 (1740), and later editions.

89 *Op. cit.*, second ed., pp. 22-23. The same appears (but less fully) in the first edition.

"is as clear as any spring water, but not altogether so white, it having a little cast upon the straw colour. It has a pleasant taste and affects the tongue with a kind of fulness, not unlike as if a small quantity of milk was mixt with the water; and none but a very nice taste can discover any saline taste in it. The mineral particles are so well mixed and united with it that no sediment is to be perceived at the bottom of the bottles after several months keeping; and Mr. Kellaway had some by him in a cask 14 or 15 months; at the end of which time, it was found perfectly fine, boiled white, &c., and seemed as efficacious as when first pump'd from the spring; but it tasted a little of the cask and look'd of a deeper colour, . . . ; for which reason, it ought to be kept in bottles only. . . . For the encouragement of sea-faring persons, I will add . . . that some of it has been carry'd to the East & West Indies, and back again, and kept fine the whole voyage."

In the next place, Dr. Andree dilates at length on the virtues of the water, which, he says,[90] he had found valuable in many different kinds of illnesses. Thus he says that, in "obstinate loosenesses, though I have prescrib'd it to many persons in this case, I have never yet found it to fail." It is clear, indeed, that, even thus early, the water had become well known. It had been already advertised publicly for sale in London.[91]

Finally, at the end of his pamphlet, Dr. Andree inserts the signed statements of five persons, who testify that they had been completely cured of various diseases, entirely through drinking this water and after other remedies had failed to cure them.[92]

By the time of the issue of Andree's second edition, in 1740, the fame of the Tilbury Water had increased greatly, and he speaks with still greater confidence of its curative value. It had

"been found [he says[93]] to cure, like a specifick, the diarrhæa, dysentery, the bleeding of the piles, and immoderate fluxes of the menses; and is of great service in the fluor albus and seminal weaknesses. . . . It likewise relieves the gravel and stone, the asthma, and complaints from the gout, as well as disorders of the bowels and scorbutick ailments."

After further discourse thereon, he continues[94]:—

"The water has at present so great a reputation for curing diarrhæas among the publick that it would be looked upon in me impertinent to swell this treatise with cures of that kind. . . . I have ordered it to persons of all ages, even to very young children, when troubled with watery (or what they call more properly bilious) griping stools; to women in child-bed; in intermittent, nervous, hectick,

90 *Op. cit.*, first ed., pp. 22-30 (1737).

91 In the *Daily Advertiser* (and, probably, in other papers).

92 *Op. cit.*, first ed., pp. 31-38 (1737). These "cases," with two more added, appear also in the second (pp. 35-40) and later editions. One of the testimonials states that the writer had been led to visit the well and drink the water through hearing of its fame when in Scotland.

93 *Op. cit.*, second ed., p. 23 (1740).

94 *Op. cit.*, second ed., pp. 24-25 (1740).

and inflammatory fevers; the consumptive; and the small-pox, upon several occasions, with good success."

In June 1740, Dr. John Rutty had a sample of the water (bottled more than three months earlier) sent to him in Dublin. After examining it, he wrote[95] that he found it

"impregnated with a comparatively-large proportion of salt, approaching, in most of its properties, to those of the fixed artificial alkalis, but of a less degree of acrimony and envelopped with an absorbent and ochreous matter which probably may give it some degree of stypticity."

The third edition of Dr. Andree's pamphlet appeared in 1764. In it, the author made practically no alterations of importance. It is clear, however, that the fame of the water had continued to increase steadily; for the doctor declared[96] that it was needless for him to insert additional cases,

"since long experience proves that the water retains still the same sanative properties mentioned at first; its surest and strongest commendation being that the Physical Gentlemen of this Town [*i.e.*, London] recommend and order it in common to their patients for diarrheas, weakness of the bowels, and the other complaints mentioned in this treatise, and that it is used all over the kingdom, and also in foreign parts, with great success."

As further evidence that, at this period, the Tilbury water enjoyed widespread fame, we have Morant's statement,[97] in 1768, that, of all the Essex waters, it alone had kept up its reputation; also the "Gentleman's" assertion[98] that it "deservedly retains the highest reputation."

The fourth edition of Andree's pamphlet, published in 1779, seems to contain nothing new in regard to the water, except the statement that Sir Hans Sloane had been "so well convinced of the great efficacy of the Tilbury water that he frequently recommended it to his patients."

This edition was published, not by a regular "bookseller" (there were then, of course, no "publishers" in the modern sense), but by one John Ellison, a chemist, who made a specialty of dealing in medicinal waters, having "mineral water warehouses" in St. Alban's Street, Pall Mall, and near Red Lion Street, Whitechapel. He describes himself[99] as "sole proprietor" of the Tilbury Hall water; by which he meant, doubtless, that he was the sole agent for the sale of it to the

95 *Methodical Synopsis*, p. 428 (1757).
96 *Op. cit.*, third ed., p. [6] (1764).
97 *Hist. of Essex*, i., p. xxv. (1768).
98 *Hist. of Essex*, i., p. 10 (1770).
99 See a *Synopsis of the Medicinal Contents of the most noted Mineral Waters analysed by Dr. [Bryan] Higgins at the instance of John Ellison*, p. 8 (1788).

public. Each bottle sold by him bore, he says, his name and the words "West Tilbury Hall." At this period, and for at least ten years later, Ellison was advertising the Tilbury water extensively in the London newspapers and seems to have had a good sale for it.

When Dr. Trinder wrote, in 1783, West Tilbury Hall and the well upon it belonged to Lieut.-Col. Hunt, of the West Essex Militia.[100] Trinder, describing the water, says[101] that it

"is of an amber colour, like pale rum, and it has a full and soft taste in the mouth, not unlike that of milk and water, and it is inodorous."

After detailing the results of seventeen experiments on it, he continues:—

"This water hath been found to be very useful in the cure of diseases arising from acidity in the first passages, such as heart-burn, sour eructations, flatus, and indigestion;"

adding that he believes it will be found valuable in certain forms of gout, and that it is "recommended by a crowd of cases, as efficacious in the cure of diarrhea, and even dysentery."

Somewhat before this time Ellison had employed Dr. Bryan Higgins, an eminent London physician and chemist,[102] to analyse the water. Higgins visited the well on 22nd September 1779, and obtained some of the water. Having analysed it, he reported,[103] on 11th October following, that he had found one Winchester Gallon to contain:—

	dwt.	grs.
Of calcareous earth, saturated with acidulous gas	1.	13
Of true nitre, with basis of fixed vegetable alkali	2.	1
Of sea salt	3.	10
Of mineral alkali	0.	$1\frac{1}{2}$
Of mineral oleaginous matter (by estimation)	0.	$1\frac{1}{4}$
	7.	$2\frac{3}{4}$

"Two quarts of acidulous gas (which is, in density, to temperate atmospheric air, nearly as 2 to 1) are contained [he adds] in each gallon of this water, beyond the quantity of acidulous gas retained by the calcareous earth above mentioned, in the heat of boiling water."

100 *Medicinal Waters in Essex*, p. 1 (1783). Morant says (*Hist. of Essex*, i, p. 231) that, after Kellaway's death in 1737, his widow sold the estate to Capt. Richard Micklefield, late of the East India Company's service, who left it to his nephew, Richard Hunt, Esq.

101 *Op. cit.*, pp. 1-8.

102 Dr. Higgins (1737 ?-1820) was born at Sligo and took his degree of M.D. at Leyden. He spent most of his life in London, but paid extended visits to the West Indies.

103 *Synopsis of Analyses of Noted Mineral Waters*, p. 1 (1788). At some other time, Higgins had made another analysis of the water, with slightly different results (See Trinder, *Medicinal Waters*, pp. 5-6 (1783).

Trinder, writing in 1783, describes another mineral water from West Tilbury, namely, that "from the Rector's well":—

"This water rises [he says[104]] at a little distance from Tilbury Hall, on the side of the hill, and it issues from a pump in the parsonage house. It is inodorous; its taste is agreeable; but it is somewhat less full in the mouth, and it has less of the amber colour than the other water."

It was, he adds, practically the same water as that of Tilbury Hall, but contained far less "mineral" matter, in the form of fixed alkali, This is shown in the analysis by Dr. Bryan Higgins, "as published by Mr. Ellison," wherein he says he found that a Winchester gallon contained:—

	dwt.	grs.
Of calcareous earth, saturated with acidulous gas	0.	10½
Of true nitre, with basis of fixed vegetable alkali	1.	8
Of sea salt	2,	0
Of mineral alkali	0.	0½
Of mineral oleaginious matter (about)	0.	0½
	3.	19½

"Nevertheless [continues Trinder[105]], the late Rector of Tilbury, the Churchwardens, and the other inhabitants of the parish did certify 'that the Rector's Well water had been analysed by several eminent physicians, who found it to afford the same principles as the other, except that, in this, they are in greater quantity.'"

This was apparently in 1759.[106] Dr. Higgins says[107] that the certificate on which they acted was fabricated.

This water "from the Rector's Well" was being sold in London in 1783 by a Mr. Owen, another dealer in mineral waters, who had warehouses near Temple Bar and in Savile Row. Between him and Ellison, there appears to have been keen competition and some bitterness.

When the Tilbury Wells lost their repute is not clear. Both the compiler of the *Beauties of England and Wales* (1803)[108] and Hughson (1809)[109] speak as though the well was still resorted to when they wrote; but their statements seem to have been copied from Morant and were probably obsolete when published.

The Tilbury Hall Well still exists. It is in the position described by André—namely at the Hall, about two miles north

104 *Medicinal Waters in Essex*, pp. 9-10 (1783).
105 *Op. cit.*, p. 11 (1783).
106 See *Synopsis of Analyses by Dr. Higgins*, p. 5 (1788).
107 *Op. et loc. cit.*
108 *Op. cit.*, v., pp. 252 and 485.
109 *London*, vi., p. 152.

from the bank of the River Thames, and near the summit of the remarkable, steep-sided, almost-isolated, gravel-topped hill, about one hundred feet high, on which stand the Hall and Church, both overlooking the wide marshy river-side levels spread out below. The pump which draws water from the well is in the brew-house at the back of the farm-house, and the well itself is believed to be beneath the floor of the dairy—that is to say it is beneath the house. The farm yard is very close to the house. A sample of water obtained on the 2nd November 1907, yielded the following results:—

Calcium carbonate	..	..	..	31·2 parts per 100,000
Calcium sulphate	..	..	..	2·7 ,, ,, ,,
Magnesium sulphate	..	..	..	10·4 ,, ,, ,,
Sodium sulphate	..	..	..	21·9 ,, ,, ,,
Sodium chloride	..	..	..	26·1 ,, ,, ,,
Sodium nitrate	..	..	..	24·3 ,, ,, ,,
Silica, etc.	..	..	..	1·4 ,, ,, ,,
Total solids	..	..	..	118·0 ,, ,, ,,

This water contains sufficient saline matter in solution to render it unsuitable for many domestic purposes, but not sufficient to justify its being considered a "mineral" water. Its special constituent is the sodium nitrate, which is derived from the oxidation of manurial matter by the soil. During such oxidation, much carbonic acid gas is produced: hence this and similar heavily-nitrated waters are often regarded with great favour, since they "sparkle" when first drawn and have a cooling saline taste.

The "Rector's Well" at Tilbury also still exists. It is in "Church Field," on the site of the old Rectory (of which no other trace now remains[109a]), near the south-eastern extremity of the hill above mentioned, about fifty yards from the point at which the hill begins to rise from the level marshes and about an equal distance from the road which leads up the hill to the church. It is in an arable field below the Church, the very sandy and gravelly soil of which was planted with vegetable marrows at the time of Mr. Christy's visit. As the mouth of the well is open and is not fenced round or marked in any way, it

109a It was pulled down (as the Rector, the Rev. J. Bonamy Dobree, has been good enough to inform us) about a century ago, when the present rectory, half-a-mile distant and near the top of Gun Hill, was acquired. It is marked on the 6-in. Ordnance Map as "Mineral Well, disused."

must be very dangerous to persons who do not know of its existence, to say nothing of cattle, game, and straying dogs. The top of the well is about fifteen feet above the level of the marsh ; the distance to the surface of the water is about 19 feet 6 inches; and there is about three feet of water at the bottom. The well is about four feet in diameter ; but smaller at the top, and it is bricked round with small bricks to a depth of about 10 feet, below which the sides are apparently of firm sand. There was no carbonic acid gas in the well when Mr. Christy visited it on the 14th September 1907, but the water was in a very filthy and polluted condition, containing a large quantity of decaying vegetable (and apparently also animal) matter, which had formed a thick scum on the surface. It was very turbid and green, and had a very foul putrid smell.

All the inhabitants of the parish seem to believe that this is the once-famous Tilbury medicinal well, and at once direct the enquirer to it. They also tell him tales, told to them by their parents and grandparents, of the many grand people who used, at one time, to come in their carriages to fetch water from the well. They assert, too, that a small and picturesque reed-thatched cottage, standing close adjacent, in a copse known as "Cooper's Shaw," was built for the occupation of the custodian of the well. The fact remains, however, that this is not the once-famous well, but "the Rector's Well," of lesser fame, which has somehow managed to usurp the reputation of its more-famous neighbour.

A sample of the water obtained from this well, on the date above named, yielded, when analysed, the following results : —

Calcium carbonate	27·7	parts per	100,000
Magnesium carbonate	7·2	,, ,,	,,
Sodium carbonate	2·05	,, ,,	,,
Sodium sulphate	3·7	,, ,,	,,
Sodium chloride	18·8	,, ,,	,,
Organic matter in residue	30·0	,, ,,	,,
Silica, etc.	2·1	,, ,,	,,
Total solids	110·0	,, ,,	,,

This is a water of considerable interest, notwithstanding its present grossly-polluted condition, as it is probably the only water found in Essex containing sodium carbonate, except those derived from deep wells in the Chalk or Thanet Sands. It is

significant that the Thanet Sand comes to the surface at West Tilbury, close to the Hall, and from it, no doubt, the constituent in question is derived. It was probably the presence of sodium carbonate in this water which led to its being regarded as medicinal in days when such waters were rare, owing to the absence of deep wells.

Mr. Dalton writes that both the Tilbury wells "pass through a greater or less depth of old Thames gravel into the Thanet Sand, from which their waters derive the basic elements they possess, whilst the decomposition of organic matter supplies the sulphuric and nitric acids to replace some or all of the carbonic acid of the original salts. The Hall Well, from its abundant manurial accession, has no carbonates of soda or magnesia; the Rector's Well, depending more on casual advent of unfortunate animals, still has them in fair quantity, together with enough sodic chloride to suggest marine diffusion, the water being much below half-tide level."

(12).—*The Chigwell-Row Spring.*—Morant, writing in 1768, says[110]:—

The name [of the parish] was occasioned by a well in Chigwell-Row, behind the wind-mill, among the trees, whose water has a purging quality, and the late Dr. Frewin used to speak in its favour. That celebrated physician was born in Chigwell-Row, . . . and he used to visit the place every two or three years until his decease.[111] Near this well, there is a hole or hollow place, wherein is a water of the same nature, perhaps proceeding from the other.

Morant's statement leads one to infer that the well, though it may have possessed the qualities ascribed to it, was never largely resorted to. In any case, by the end of the century, it was completely neglected.[112]

The well in question exists no longer. Upon a recent visit, however, Mr. Christy found that the older residents were able still to point out its approximate site. This is in a meadow of about thirty acres, called "Park Field," belonging to Mr. Philip Savill and near his residence, "The Woodlands."[113] The well was on the steep southern slope of the bold hill-side of

110 *Hist. of Essex*, i., p. 164 (1768). All the later county historians merely copy from Morant.

111 Richard Frewin (1681?-1761), M.D., was a son of Ralph Frewin, of London. He took his degree at Oxford, where Frewin Hall takes its name from him, but practised in London. He married and survived three wives.

112 See Lysons, *Environs*, iv., p. 129 (1796), and Ogborne, *Hist. of Essex*, p. 248 (1814).

113 We are indebted to Mr. Savill for his kindness in procuring information for us.

London Clay, lying on the south side of the main road. It lay due south from Forest House, about three hundred yards from the road, and not very much further from the new Grange Hill Station of the Great Eastern Railway. A Mr. College, who has lived many years in the parish (in which he was born), stated that he could remember the well as a hollow place, bricked round, with steps leading down to the water. The surplus water was conveyed through pipes into an adjacent ditch. The well was, however, drained, filled up, and turfed over about thirty years ago by a Mr. Radley, acting on behalf of the then-owner, a Mr. Fowell, and there is now nothing to indicate its exact site.

The windmill mentioned by Morant was struck by lightning and burned down about fifty years ago, and the trees he mentions as surrounding the well (part of old Hainault Forest) were probably cut down even earlier. About fifty yards from the reputed site of the well, there is a small stagnant field-pond for the use of the cattle of an adjacent farm—probably the "hole or hollow place" mentioned by Morant.

The former fame of the well is, however, not forgotten locally. The Mr. College mentioned above spoke of it as "The Purging Well," and another resident interviewed knew it by the same name. Mr. College mentioned a Dr. Reeve, formerly of Chigwell Row, who, he said, had declared the water of the well to be "as good as any medicine" as a purgative.

Mr. Dalton points out that, around the site of the well, the London Clay is not much short of its full thickness (about 400ft.), so the water may be attributed to some of the sandy beds which mark its gradual passage into the Bagshot sands.

(13).—*The Havering Spring.*—Morant, after describing the spring at Chigwell Row, noticed above, continues[114] :—

"In Havering Liberty, there is also another Purging Water, in a well near Bone (or, rather, Bourne) Bridge, under which runs a small stream of common water."

No other writer, so far as we know, alludes to this well, but the fact of its having been regarded formerly as a medicinal well is still remembered locally. A woman living in a cottage close to Bourne Bridge was able at once to direct Mr. Christy to

114 *Hist. of Essex*, i., p. 164 (1768). The "Gentleman" (*Hist. of Essex*, iv., p. 3n. : 1770) merely follows Morant.

it; and Mr. Henry Aylett, living near Boyland's Oak, stated that he remembers drinking its water, forty years ago, when he was a boy, but that the well is now entirely neglected and unknown to the rising generation.

The well is in a meadow, known as "Purging-well-Field,"[115] at a spot about midway between Bourne Bridge and the old windmill at Boyland's Oak, and about one hundred yards north from the belt of trees bounding Havering Park. It is on a steep northerly slope, and it is marked by a solitary maple-tree growing over it. The base of this tree is now piled round with faggots, intended to form a shelter for game. These entirely conceal any water there may be in the well; which, so far as one can see, is now dry. Mr. Aylett says that it was always a very small spring—merely a hollow in the ground, about the size of a hand-basin, with a little water in it.

Mr. Dalton points out that this spring is situate in a broad spread of London Clay of about medium thickness.

(14).—*The Wethersfield Spring.*—A chalybeate spring in this parish was mentioned in 1769 by the compiler of the *History of Essex*, "by a Gentleman," who writes[116] that,

In the road to Bocking, at a small distance from the town, is a well with a most excellent chalybeate spring, but now undeservedly neglected. There are other chalybeate springs in this parish, of less note; but, if analised by a skilful person, [they] would be found to be of a superior quality. This we are authorised to say by undoubted intelligence from a Gentleman who has tasted them and in whose opinion they are highly worthy of notice.

Mr. Dalton observes that the road to Bocking passes over a series of low ridges of London Clay, capped by spurs of Glacial Gravel, and that the spring referred to is, doubtless, at the junction of the two series.

(15).—*The Gidea Hall Spring.*—The first writer to draw attention to this spring appears to have been Trinder, in 1783. He says[117] that the

"Gidea Hall Water rises on the bank of a canal in the park of Richard Benyon, Esq., near Romford in Essex. A great quantity of ochreous earth appears in the channel of this spring, and also in various parts of the adjacent

115 See Mr. W. C. Waller, F.S.A., in *Trans. Essex Archæol. Soc.*, n.s., vi., p. 78 (1878). A "First Purge Field" and a "Second Purge Field" also exist in Havering parish.

116 *Op. cit.*, ii. (1769), p. 21.

117 *Medicinal Waters in Essex*, p. 13 (1783).

land. Its taste is remarkably ferruginous ; but, nevertheless, the spirituous part of the water conveys a very agreeable sense of freshness to the mouth."

Trinder next gives the results of seventeen experiments he made upon the water, detailing the colours it assumed when tested with various chemicals and in other ways. His conclusion was[118] that it belonged to "the first class of chalybeates" and was "impregnated with magnesia, glauber's salts, and with sulphur." It would be valuable, he says, in dropsy arising from debility, hypochondriacal and hysterical diseases, obstructions of the liver after a period of intemperance, and in low nervous fevers, by reason of the sulphur contained in it and its mildly purgative qualities ; for, he says, "it attenuates the fluids and expels noxious matter from the body." He adds :—

"I am sorry to inform the Ladies that tea must be condemned as improper during a course of this water ; for tea, like other austere vegetables, will precipitate the ferruginous particles in the water and render them unfit to enter into the lacteals and absorbents and so to execute their desired office."

The well in question no longer exists, having been drained, filled up, and turfed over about four years ago. It was near the top of the steep slope overlooking the lake (known as "Black's Canal") which bounds the south-west side of Gidea Hall Park, and its site lies just within that portion of the park (forty acres in extent and now known as "Raphael Park") which was given to the town of Romford by Mr. H. H. Raphael a few years ago, for use as a public park.

Mr. Joseph Sibthorpe, the present Park-Superintendent, informed Mr. Christy that the well used to be about three feet across, bricked round, with steps leading down to the water, and that the ferruginous deposit round it was very obvious, as mentioned by Trinder. He added that the over-flow water ran down a small ditch into the lake. He stated also that people from the neighbourhood used frequently to obtain water from it for use medicinally—especially for the cure of sore and inflamed eyes. He has himself used the water for this purpose.

When the park became public, the well was done away with, so that children might not fall into it whilst at play. Consequently, no sample of its water is now obtainable. A very slight depression in the turf still indicates the site of the well.

Mr. Dalton surmises that the water of this well came from the junction of the London Clay and the Thames Gravel.

118 *Op. cit.*, p. 17.

(16).—*The Hornchurch Lane Spring.*—Trinder says[119] :—

"In Horn-Church Lane, about a mile from Romford, a small spring of water rises to view; which, I believe, hath not been hitherto much noticed nor regarded. It is perfectly clear; it has no peculiar taste; and it is inodorous."

After detailing the usual experiments, fourteen in number, he continues[120]:—

"It appears that this almost-pure water is impregnated with an alkaline salt and with but little or no terrestrial matter. . . .

"This excellent water, if used as a common drink, will act as a good resolvent in all coagulations from acids. It is likely to retard the approaches of an early gout and to be serviceable where there be a sluggish viscous phlegm (occasioned by the acetous fermentation in the stomach); and, also, it may do good in concretions from fat tenacious humours, as in jaundice, rheumatism, and scurvy.

"Bread made from this light water must be excellent, and it deserves the regard of the frugal laundress, for she will use less soap in washing her linen with this than with common water."

This spring (which has long been known as "The Havering Well") still exists and is easily identifiable. It (or perhaps one should say the receptacle into which its water runs) is in the ditch on the east side of the road from Romford to Hornchurch, about a mile south from Romford and about twenty-five yards north of the angle in the road.[121] The whole of the meadow land, covering an area of some ten or twenty acres, in this angle of the road (at the back of the Roneo Company's Factory, that is) is moist and full of springs, so that it is impossible to say precisely where the spring-head may be; but, by the roadside, at the spot above mentioned, the water accumulates in a small barrel, which is let into the ground so that its top is level with the surface.[122]

The well in question must have been formerly of much greater consequence than now; otherwise it would hardly have become known by the name of the ancient "Liberty" in which it lies. It gives name in turn to the Hamlet of Havering-Well (in Hornchurch parish) in which it is situated, as well as to Havering-Well Farm and Villa, both being near.

Its former fame as a medicinal spring is not forgotten locally; for Mr. Christy was informed that its water is still reputed to

119 *Medicinal Waters in Essex*, p. 20 (1783)

120 *Op. cit.*, pp. 21-23.

121 It is marked both on Chapman and André's Map of Essex (1777) and on the 6-inch Ordnance Map.

122 One of the deep wells and pumping stations of the South Essex Waterworks Company stands within a hundred yards of the spring, but the two have, of course, no relation to one another.

have medicinal value, especially as a cure for "sore eyes," and that it has been used for that purpose in recent years by people in the neighbourhood. A sample obtained on the 10th September 1907 yielded, on analysis, the following results :—

Calcium carbonate	.. .. ..	17·6 parts per	100,000
Calcium sulphate	.. .. ..	21·1 ,, ,,	,,
Magnesium sulphate	.. .. ..	5·9 ,, ,,	,,
Magnesium chloride	.. .. ..	1·17 ,, ,,	,,
Sodium chloride	.. .. ..	12·42 ,, ,,	,,
Sodium nitrate	.. .. ..	5·2 ,, ,,	,,
Silica, etc.	.. ..	0·61 ,, ,,	,,
Total solids	.. ..	64·00 ,, ,,	,,

This water cannot be regarded as possessing any special medicinal value. It is an ordinary water, containing a fair amount of calcium sulphate, which is derived, in all probability, from selenite in the London Clay. In many places in Essex, large crystals of this mineral are found imbedded in the superficial layers of that clay.

Mr. Dalton regards this water as coming from the Thames Gravel and as held up by the London Clay just below, which (he thinks) supplies the calcium and magnesium sulphates and possibly also the sodium chloride.

(17.)—*The Stapleford Abbots Spring.*—Trinder, speaking of this as "The Forest Water," says[123] that it

"rises on the north side of the Forest, in the parish of Stapleford Abbots, on an ascent, and nearly full south to a good house of grey brick on the neighbouring hill, which is about five miles from Romford."

Of the water itself, he says that "It has an earthy and also a brackish taste. It has an earthy smell and its colour is whitish." After giving in detail the results of fourteen experiments upon it, he says[124] :—

"From these experiments, it appears that this water, besides its bitter purging salt, is impregnated with iron and sea salt.

"In colics (whether bilious, flatulent, or nephritic), it has been used with good effect, but especially if drunk warm or used as a clyster.

"The rustics in the neighbourhood usually apply to it twice in the year, as to a thorough cleanser of the system; and they say that three or four pints commonly produces six or eight stools; but they complain of a soreness *in ano* during its operation and, therefore, I would advise those persons who are subject to irritation to be cautious in the use of it.

123 *Medicinal Waters in Essex*, p. 24 (1783).
124 *Op. cit.*, pp. 26-28.

"This water is said (and, indeed, it is very likely) to do good in cutaneous foulness of the skin, in removing pimples and obstinate pustules attended with heat and itching, and also in the cold scurvy attending phlegmatic habits, especially if half a dram of common salt be added to each half pint of the water. It is said also to cure sore eyes and sore legs. . . .

"This water deserves a trial in violent head-achs arising from too great viscidity of the fluids and also in cachexy, where the body be bloated and pale; for waters of this description (especially if enlivened by the addition of a little salt) stimulate the vessels, thin the fluids, carry off the foul humours by stool, urine, or vomit, and then, by their invigorating power, they enable the vessels to resist a fresh oppression."

We have not been able satisfactorily to identify the well in question, chiefly because Trinder does not name the "good house of grey brick on the neighbouring hill" from which the spring lies "nearly full south." The Jacobean mansion known as "Albyns" (which is about five miles from Romford) might very well be intended, but for the fact that it is of red brick.

The Rev. Lewis N. Prance, F.S.A., of Stapleford Tawney, who has been good enough to make enquiries on our behalf, can hear of no well in Stapleford Abbots which has the reputation of possessing medicinal properties. He suggests that the well-known spring on Curtis Mill Green may be the one intended.[125] This lies about one hundred and fifty yards east from the eastern entrance to the park of Albyns. It is a large and strong spring, from which water flows steadily, causing a large boggy place on the common, and it is never dry. The well itself is of some size, measuring about fifteen feet by eight feet, and it is about four feet deep. One side is bricked and the whole is well fenced round, to protect it from pollution by cattle. Its water has no particular taste, smell, or colour, and looks pure. It is used largely in the vicinity for domestic purposes.

While this may be the well in question, it does not altogether answer to Trinder's statements. It is not on rising ground and it is not in Stapleford Abbots, as it lies just across the parish boundary, in Navestock. Moreover, there is no house of grey brick to the north of it, though "Suttons (Sir Drummond Smith's), which is painted white, and may be built of grey brick, stands on rising ground about a quarter of a mile north-east. On the other hand, the well is within a few hundred yards of Richard's Stone, the northernmost boundary of old Hainhault Forest. On the whole, we know of nc other well answering

125 It is shown on the 6-in. Ordnance Map.

more nearly to the description given; and, on the 12th September 1907, we obtained from it some water, which, on analysis, yielded the following results :—

Calcium carbonate	.. .. ..	5·5 parts per	100,000
Calcium sulphate	.. .. ..	9·8 ,, ,,	,,
Magnesium sulphate	.. .. ..	8·76 ,, ,,	,,
Magnesium chloride	.. .. ..	3·24 ,, ,,	,,
Sodium chloride	.. .. ..	3·9 ,, ,,	,,
Sodium nitrate	.. .. ..	4·8 ,, ,,	,,
Silica, etc.	.. ..	1·5 ,, ,,	,,
Total solids	.. ..	37·50 ,, ,,	,,

This is an ordinary water, such as is derived commonly from the sands wherever in Essex they are overlaid by a little Boulder Clay. It has no medicinal value.

(18).—*The Springfield Spring.*—Trinder says[126] :—

"This water rises on the sedgy bank of the River Chelmer, about a mile eastward from Chelmsford. It is clear and inodorous, and it throws up bubbles and a whitish-coloured sand to the surface of the well; which is no bad sign of a perpetual spring."

After detailing the results of the usual experiments, fifteen in number, he continues[127] :—

"From these experiments, I am inclined to think that this water is selenitic and that it is also, in a very small degree, impregnated with iron and sulphur and with a little of the nitrum calcareum, or purging salt, of Dr. Rutty. It is comparatively a light water; and, if it act as a purgative, it is chiefly because of its diluent power and its coldness."

Finally, he describes the case of Mrs. Hollingsworth, of Springfield, who was confined to bed for many months through extreme debility, accompanied by obstinate costiveness. At last, being advised by Dr. Menish, of Chelmsford, to drink the waters of this spring, she did so, and was soon completely cured. Dr. Menish (who was a friend of Trinder's) was, no doubt, the discoverer of the spring.

From Trinder's description of the locality of this spring (which, he says, was "in a field belonging to Mr. Pugh"), it must have been on or near Barnes Farm. There are, however, so many springs near the river bank in that vicinity that it is now impossible to identify the one in question.

As to the site of the spring, Mr. Dalton writes :—"The Glacial-gravels extending to the edge of the Alluvium of the

126 *Medicinal Waters in Essex*, p. 47 (1783).
127 *Op. cit*, pp. 50-51.

Chelmer are underlaid, at or near that level, by the London Clay. On the Baddow side, some Lower Glacial Boulder-clay intervenes, not separately mapped, but noted as brickearth on the Survey map; and I suspect the same on the northern bank, more or less draped by the washing down of the gravel. This, by furnishing lime to the sulphuric acid of the London Clay, would yield a slightly selenitic water."

(19).—*The Twinstead Spring.*—In the year 1791, a mineral spring was discovered in the parsonage glebe at this place. Sir James Marriott, Knight,[128] who then owned Twinstead Hall, writing from Snaresbrook on 19 July 1791, tells of the number of visitors attracted to the village to see the church, which he had recently rebuilt, and adds[129]:—

"A medical man has discovered a very light mineral and sulphureous spring in the glebe of the parsonage, and so he, with his brethren, will have an interest in puffing [the place]."

Mr. Dalton surmises that the well in question was probably at the junction of the Glacial-gravels with the lower part of the London Clay. He adds that the Reading Beds outcrop within a mile eastward from the church, in the floor of the side-valley between Twinstead and Great Henny.

(20).—*St. Chad's Well at Ilford.*—A well to which curative properties have been ascribed exists near Little Heath, in Great Ilford. Mr. G. E. Tasker speaks[130] of it as

"a reputed medicinal well in Billett Lane, near Little Heath, which was at one time much resorted to by persons with weak eyesight, for the special properties of the water were supposed to be beneficial to the eyes. It is possible that the well may have existed at the time of the brother bishops, for it was often the custom among missionaries in those far-off days to baptise their converts at some well or spring which happened to be handy. These wells frequently took the name of the holy man, and it is said that Cedde held a baptism at this spot, and because of the healing qualities of the water, and in memory of his brother Chad, whose fame had spread all over the country, it became known to future generations at St. Chad's Well.

"Be that as it may, the well in Billett Lane has existed a long time, and there is very little doubt that it gave its name to the two hamlets of Chadwell Street and Chadwell Heath. It lies quite solitary on the roadside, and is partly protected by an alcove of brickwork. Its appearance is so strange at dusk that horses unused to the road often 'shy' at it. The water is of excellent quality;

128 Sir James Marriott (1730-1803) was a judge, an M.P., and a vice-chancellor of the University of Cambridge. He died at Twinstead Hall, aged 73.

129 See *Essex Review*, xv., p. 198 (1906). The original letter is in the Bodleian Library

130 *Ilford, Past and Present*, pp. 108-109 (1904).

it has never been known to fail; and there is a constant running off of the surplus. It was once the only water-supply to the few cottages near. The East London Water Company has now extended its mains to some of the houses. The well goes by the name of Brick Well, the Bricken Well . . . and the Wooden Well, according to fancy and local usage. There are other wells near, notably the one at Paulatim Lodge, in Whalebone Lane."

Mr. Christy has visited the well and corroborates the accuracy of Mr. Tasker's description. The dome of brickwork covering the well (fig. 5) looks as though it might have been built in the Eighteenth Century, but has been repaired quite

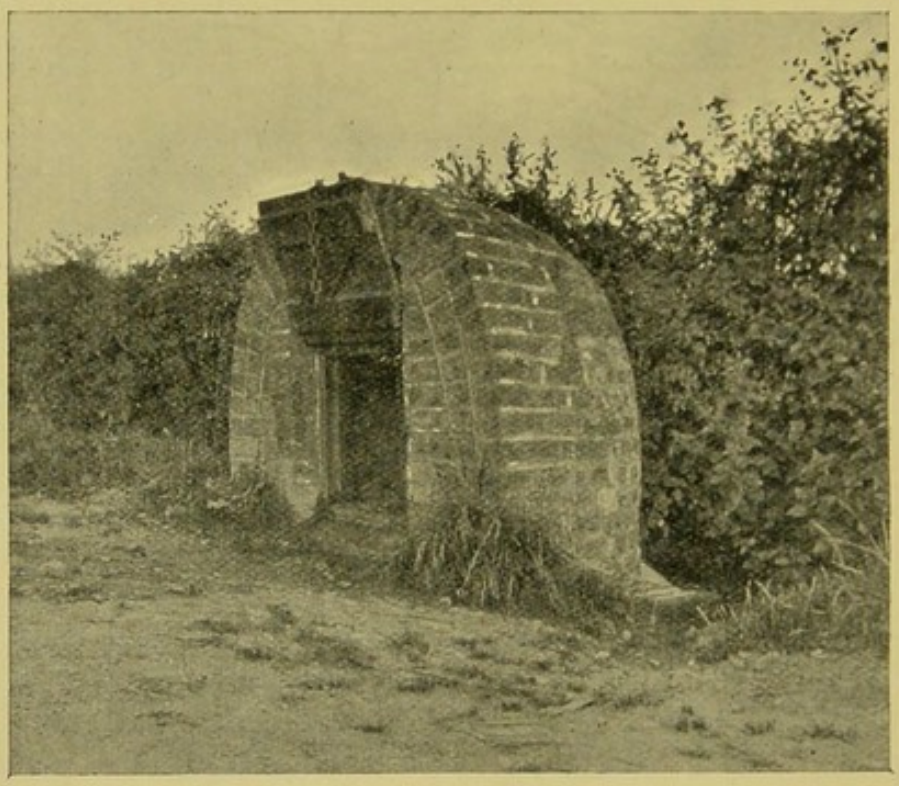

FIG. 5.—ST. CHAD'S WELL AT ILFORD

(from a photograph by Miller Christy).

recently. It stands actually in a roadside ditch, but the spring is said to be some fifty yards distant, in a field, the owner of which claims the well. The water is perfectly clear and has neither taste nor smell. The surplus constantly runs off into the ditch. A man living in the vicinity of the well stated that it was used formerly for the cure of sore eyes and other ailments, but that it is used also for domestic purposes by the cottagers living near.

A sample obtained on the 10th September 1907 yielded the following results :—

Calcium carbonate	9·7	parts	per	100,000
Calcium sulphate	22·4	,,	,,	,,
Calcium chloride	3·0	,,	,,	,,
Magnesium chloride	11·3	,,	,,	,,
Sodium chloride	0·5	,,	,,	,,
Potassium and sodium nitrate ..	12·8	,,	,,	,,
Silica, etc.	3·3	,,	,,	,,
Total solids ..	63 0	,,	,,	,,

This water is unusual in character, as the magnesium salt present is the chloride and not the sulphate, as is generally the case. The water appears to be derived from beds like those at Hornchurch ("Havering Well"), but this contains a larger proportion of magnesium. It cannot be regarded as of any value medicinally. It is obviously affected by manured soil in its immediate vicinity, as it contains a fairly-large quantity of nitrates, derived from the oxidation of manurial matter.

Mr. Dalton thinks that this water must come from "the Thames Gravel at its junction with the London Clay."

(21).—*The South Bemfleet Spring.*—For our knowledge of this spring, we are indebted to Dr. Henry Laver, F.S.A., of Colchester, who writes us:—

"I remember this spring very well in my school-boy days, over fifty years ago. It was at the base of a small cliff of London Clay, on a farm held by two brothers named Woodward. The spot was in a line from the Castle at Hadleigh to Bemfleet, just at or below the edge of the valley. To get to it you went down a lane leading from about the middle of the Common, as it then existed. Possibly, it was in Hadleigh parish. The cliff of London Clay was constantly slipping, as it is doing all along the steep slope on the North bank of the Thames all the way from Southend to Bemfleet and elsewhere round our Essex Coast. Probably, therefore, anyone who visited the locality now, in search of the well, would be unable to find it, owing to the changes which have taken place.

"The well itself was very small—merely a 'drizzle.' I remember well the flavour of its water, which was strongly impregnated with what I know now to be sulphate of soda

(Glauber's Salt). Among my schoolfellows there were many who drank some of the water, and they used to get purgings from it. I remember hearing one of the Woodwards—a very fat man—say that it would purge the horses when they drank of it."

For the reason given by Dr. Laver, it would now be impossible, we fear, to identify the spring in question.

(22).—*The Plaistow Spring.*—This seems to have been a small spring of purely-local fame. Miss Katherine Fry says[130a] that the "Lady Well Field," almost opposite Plaistow Grove, was

so called from a natural spring of very pure water which until recently was still in existence. . . . Some picturesque superstitions were attached to this well, even in the memory of persons now living; . . . and these romantic legends attached to it are probably founded on some miraculous qualities attributed to it by the monks. That the water of this old well was famous for the cure of sore eyes, we may accept as a fact; since frequent washing with clear, pure, and fresh spring water, would unquestionably be beneficial to eyes unaccustomed to its free use.

(23).—*The Hockley Spa.*—One of the latest attempts to establish a regular "Spa" in Essex was at Hockley, between Rayleigh and Rochford. The facts are recorded by Granville, who says[131] that an old friend, a physician of eminence, had recommended him to visit Southend, and that Mr. Richard Phillips had called his attention to the newly-discovered spa at Hockley. Accordingly he went thither, in January 1841, after having (he confesses) "turned up my nose at the idea," because, he says, "Essex is a county with a bad name" for invalids. He relates that, on arriving at Hockley, he was conducted to

"the lowest part of the village, where we found three or four cottages, the property of Mr. Fawcett, solicitor; one of which, more showy than the rest, bore the inscription of "Hockley Spa Lodge." In this I took shelter for the night, and there learned from the elderly couple who occupied it, and received us hospitably, the history of the discovery of the well, which was briefly this:—

"Mr. and Mrs. Clay (for such was the name of my good-natured and clear-headed host and hostess) had determined upon building for themselves a cottage in this elevated region, after having escaped the relaxing and weakening effects of a long residence in Cheltenham. A well was sunk for water, for the convenience of the cottage; when, in throwing out the sod, a hard stone was found, about a foot in diameter, which, when exposed to the air, fell in pieces. It was hollow within, about the size of a two-quart basin, in which was fine clear water. Proceeding further down, a kind of ragstone and

130a *Hist. of East and West Ham*, p. 126 (1888).
131 *Spas of England*, ii., pp. 606-610 (1841).

gravel appeared, and clear spring-water flowed. Mrs. Clay, who had been asthmatic all her life and subject to cough, except when she drank Cheltenham water, after drinking of the new well's water for some little time, found that she lost her difficulty of breathing and her cough became less troublesome.[132] At the end of a twelvemonth, she was so much better, in both respects, that she was inclined to attribute her recovery to air and situation only. A visit, however, to some friends in London on one occasion, and somewhere else on another, having taken her away from the well, her constitution became heated, the cough returned, and asthma began to plague her again; all which symptoms disappeared on returning to Hockley Cottage and beginning the water once more. This awoke surmises as to the said water possessing medicinal properties. The notion having once gone abroad, it was immediately seized upon by many in the neighbourhood, who used the water, which was most liberally supplied to them; and, in the course of three more years, such was the healing reputation of Hockley Well, that not only was the water sent for from all parts of Essex, but from greater distances still, and many people of the better classes of society applied on the spot to drink it. Lastly, by the end of the fourth year from the accidental discovery of the source, a regular Spa was constituted; where I noticed, in the book of arrivals, that several persons of consequence had employed, and derived benefit from, the water.

"The proprietor, desirous of ascertaining how far the composition of the water might warrant the expectation of patients and explain its vaunted effects, at once engaged the valuable services of Mr. Richard Phillips, as before stated; who, having proceeded to the spot and made his preliminary analysis at the well, which he afterwards completed by a more extended series of experiments at home, published the result of his enquiries in the form of a pamphlet."

Of this pamphlet, we have never seen a copy, but the matter contained in it seems to have been reprinted in the following year.[133] From this reprint it appears that Phillips reported that the water was "perfectly clear, not remarkably sparkling, inodorous, and has a saline bitter taste." He sets forth in great detail the chemical tests he applied to it, with the results which are set forth hereafter.

This brings us to the time, in January 1841, when Dr. Granville visited Hockley. Let him resume his narrative:—

"The object for which my services were required was [he says[134]], first, to ascertain to what class of disorders the water might be deemed applicable and in what quantity it ought to be drank; and, secondly, what disposition and arrangements ought to be made to render the well more available to patients and the locality more generally suited to the purposes of a Spa.

"A pump has been sunk into the well, though the water in it rises to within a few feet of the surface at a short distance outside, and at the back of the cottage. After pumping for ten minutes, I ascertained the temperature to be

132 According to Mr. Philip Benton (*Hist. of Rochford Hundred*, p. 297: 1871), this was "about 1838." He adds:—"There is a stone in Hockley churchyard to Robert Clay, who died July 29th, 1843, aged 72 years, and to Letitia Case Clay, his wife, who died February 11th, 1847, aged 68 years."

133 In the *Account of Hockley Spa*, pp. 23-31 (1842).

134 *Spas of England*, ii., pp. 610-612 (1841).

47°, that of the room in which the pump was placed being only 39°, and the external air out of doors 33°, with a fine clear sky. The water appeared beautifully limpid, and colourless as crystal. Very minute bubbles of air rose in it, and seemed to increase in number for some minutes after it had been drawn. Some of these adhered to the glass. When shaken, these air-bubbles will disappear, and rise again, but at no time does the water become turbid as long as it remains cold.

"On drinking it, the first impression on the palate is rather subacid and pleasing, but the general and continuous taste is that of pure spring water. It does not taste or feel harsh to the mouth. I drank a pint tumbler of it without any marked effect, as to any feelings of chilliness or weight at the stomach. When boiled and poured into a glass, there is a manifest turbidity, the surface becomes covered almost imperceptibly with a whitish powdery deposit or cream, which, on tilting the glass, will adhere to the surface. After this experiment, the water no longer tastes subacid, and the very minute bubbles of air rise even more abundantly. Placed in contact with metals, it throws down a copious precipitate. It corrodes lead and iron rapidly, and the solder of all metallic vessels. If put into a bottle, it will not deposit any sediment; but, if a crack exists in the bottle, its edges will presently be furred with the sediment. If a large quantity of the water be boiled and afterwards allowed to cool, a large proportion of a white magnesia-looking precipitate falls down.

These remarks of mine on the physical character of Hockley mineral water I purposely made and recorded before I would allow Mr. Phillips to communicate to me his own observations and results, as I did not wish to be biassed by them.

I opened and examined the well, which I found to be about eighteen feet from the surface, with about fifteen feet of water in it. Its diameter is three feet six. During a severe and general drought in all the wells and ponds in the neighbourhood, it still was found to have ten feet of water. It has never frozen, and no landspring seems to affect it.

Judging, *a priori*, from all these data and particulars, I should be inclined to attribute very marked alterative virtues to this mineral water, when taken in small and divided doses. It will act also as an aperient in doses of a pint and a half, drank in the morning at four times, and as an antacid in stomach complaints, as well as in cases of lithic disorders of the kidneys. The water must be drank cold, and immediately after being drawn from the well.

Dr. Granville, continuing, says that he had conversed with various people who had been much benefited by drinking the water (including a child, a nephew of the proprietor, Mr. Fawcett). He ends by blessing the spa from which he had at first hoped so little. The air is (he says) "pure and bracing," and the situation "sheltered from the east." Further, he expresses pleasure that, "in a quarter of England so remote from any well known and efficient mineral spring," one should have been "so providentially brought to light." In conclusion, he recommends the building of "a first-rate hotel," as well as "a pump-room and a series of four bath-rooms."

Thus, the newly-discovered spa had been blessed by two eminent authorities, Mr. Richard Phillips and Dr. Granville, both Fellows of the Royal Society. Their opinions were supported by those of other leading medical men in London and elsewhere. Drs. Septimus and Reginald Read, of London, testified to the effect of the Hockley water in Mrs. Clay's case and to its curative value generally; Dr. James Balbirnie, of Leamington Spa, spoke to its beneficial effects in diseases of the digestive organs; and twenty-seven other eminent physicians, living chiefly in London, wrote to "highly recommend" the spa.[135]

As a result of this large body of testimony to the high medicinal value of the water and the salubrity of the neighbourhood of Hockley, the proprietor, Mr. Fawcett, was persuaded to expend a large sum of money in the development of the spa. Accordingly, in the summer of 1842, a spacious pump-room was built, from designs by Mr. James Lockyer, architect. A lithographed view of it, from a drawing by Mr. G. Hawkins, shows lofty mountains (intended, doubtless, for the Rayleigh Hills) in the distance.[136] The building was "nearly finished" at the end of October[137] and its opening (probably in the spring of 1843) was celebrated by a public breakfast.

Dr. Henry Laver, F.S.A., who was living in the vicinity at the time, watched with interest the building of the pump-room, which he describes as "big enough for Bath." "I was [he writes us] much interested in the building, and any half-holiday I could get was spent watching the work going on. I remember seeing the workmen casting the plaster ornaments for the ceiling, and it was the first time I had seen Roman Cement used to stucco a building."

Later, for the accommodation of visitors, several villas were built, as well as an hotel. The latter was erected about one hundred and fifty yards from the pump-room and on the main road to Rayleigh, Rochford, and Southend. "Upon the site of the hotel [says Benton[138]] was formerly a cottage inhabited by William Hazard, who died in 1808, aged 105;

135 See *A Brief Account of Hockley Spa*, pp. 31-33 (1842).
136 It serves as a frontispiece to the *Account of Hockley Spa* (1842).
137 See *Chelmsford Chron.*, 28th Oct. 1842.
138 *Hist. of Rochford Hund.*, p. 297 (1871).

whose life was probably prolonged to this advanced period by the beneficial influences before enumerated." Benton adds that, "at one time, vans ran to London with fresh supplies of the water." He tells, too, an amusing story in connection with the spa:—

"A gentleman of considerable standing in Dengie Hundred, having for some time been in declining health and entertaining a high opinion of the healing properties of this spring, with a view of getting the water fresh, used to send his servant at regular intervals for this beverage, and after several months' supposed trial considered himself essentially better and recruited in all respects; when the discovery was made that John, not having the same faith as to its properties as his master or disliking an irksome journey, used to fill his bottle at a nearer pump, in the meantime regaling himself with XX at the Hawk, at Battles Bridge, until the time his master anticipated his return with the life-giving elixir."

"To attend upon the visitors and sell the waters [says Mr. H. W. Bristow, F.G.S.,[139]] a woman was employed to dispense them, whose strong healthy appearance visitors were led to believe was the result of the medicinal effects of the water."

The result of all this enterprise was most discouraging; for the public withheld its patronage and refused to be cured. Dr. Laver, in sending us his recollection of the matter, writes:—"A great stir was raised, and every effort was made to get drinkers there, but without much effect. There certainly were a few visitors, but there was nothing for them to see or do, and they used to wander about looking most miserable."

The undertaking proved, therefore, wholly unremunerative and quickly collapsed. Benton, writing about 1871, stated[140] that the whole place had then "a most dilapidated appearance; the hotel has been let at £10 per annum as a beer-shop; and the unfortunate Spa-Room is used as a Baptist Chapel."

Some ten years later (say, about 1880), as I am informed by Mr. George Clements, of Hockley, a Mr. Leveaux, a French gentlemen living in London, contemplated re-establishing the spa and spent some £20 in cleaning out the old well and obtaining an analysis of the water; but his efforts came to nothing.

Again, about a dozen years later (say, about 1893), another effort was made (so Mr. Clements tells me) to develop the spa

139 In *Geol. of London and Part of the Thames Valley*, by W. Whitaker, F.R.S., i., p. 261 (Geol. Survey Memoir, 1889).

140 *Op. cit.*, p. 297.

by means of a Limited Liability Company, a prospectus of which was issued. A Mr. Coghlan and a Mr. Beck, both of London, were among the directors. Once more, however, the enterprise failed.

Nothing further was done until two or three years ago, when Mr. John H. Burgess, builder, purchased the site of the well, intending to build a house upon it. At first he thought of pulling down the old Pump-Room; but, finding that, though dilapidated in appearance, it had been well built and was still structurally sound, he decided to repair it and build his house on to it. The Pump-Room[140a] now forms, therefore, an exceedingly spacious and handsome billiard-room—larger than all the rest of the house. On the south side, there is an arched recess, in which the pump formerly stood; while, on each side of this, is a small chamber which formed the two bath-rooms. A pump outside, in the garden, now raises water from the well. The Spa Hotel, a couple of hundred yards distant, on the road from Rayleigh to Rochford, after many years of decadence, is at last a prosperous hostelry, and it is likely to do well now that the exceptionally-picturesque district around Hockley is developing rapidly as a residential district.

In regard to the chemical constituents of the water, the result of the analysis made in 1841 by Mr. Richard Phillips[141] was as follows:—

Substance.	*In one pint.*	*In one gallon.*
Common salt	11·96 grs.	95·68 grs.
Bicarbonate of lime	9·08 ,,	72·64 ,,
Sulphate of magnesia (crystallized)	41·26 ,,	330·08 ,,
Sulphate of lime	1·32 ,,	10·56 ,,
	63·62 grs.	508·96 grs.

He found, he says, no iron.

A sample of the water, obtained from Mr. Burgess' pump in July 1907, was analysed with results shown below. For purposes of comparison, we have re-calculated, on a percentage basis, the figures given by Mr. Phillips as a result of his analysis made sixty-six years earlier. Comparison seems to show that a change in the composition of the water has taken place

140a See frontispiece.
141 See *ante*, p. 55.
142 *Essex Nat.*, x p. 130 (1898).

since Mr. Phillips analysed it. The two results are as follows, if the dry residues left after evaporation, etc., are compared:—

	Our Own (1907).	*Mr. Phillips* (1841).
Calcium carbonate	39·7 parts per 100,000	72·0
Calcium sulphate	95·9 ,, ,, ,,	15·1
Magnesium sulphate	197·3 ,, ,, ,,	230·0
Sodium chloride	95·0 ,, ,, ,,	136·7
Sodium nitrate	1·2 ,, ,, ,,	—
Silica, etc...	1·3 ,, ,, ,,	—
Total solids	430·4 ,, ,, ,,	453·8

This, too, may be regarded as a genuine Mineral Water, and it is of greater strength than any other Essex water we have examined, though its constituents render it only slightly aperient. The lime salts it contains have no medicinal value. It contains a larger proportion of sodium chloride than any other Essex water we have examined. Whence this is derived is difficult to conjecture; but the sulphates of lime and magnesia come undoubtedly from the London Clay, which, in many places, is intersected in all directions with very thin laminæ of crystals of sulphate of calcium and sulphate of magnesium.

Mr. H. W. Bristow, F.G.S., late of the Geological Survey, writing of the Hockley District, says[144]:—

"Sulphate of magnesia is also present in other water from the London Clay of this district. The farmer at Plumberrow Hall [in Hockley] told me that his sheep, on being freshly brought to the farm from some other part of the county, were violently affected (scoured) by the change of water, but that, after a while, the unpleasant effects of the water wore off, and the sheep looked in better condition than at first.

(24).—*The Dovercourt Spa.*—The very latest attempt to establish a regular spa in Essex was made at Dovercourt rather more than half-a-century ago. The attempt was more or less successful, for the spa still exists to-day.

Silas Taylor, keeper of the King's Stores at Harwich, writing about the year 1676, mentions[145] a spring coming out of the cliffs between Harwich and the Beacon Hill, which yields, he says, "excellent clear and delightful water, well approved of by those

144 *Geol. of London and Part of the Thames Valley*, i., p. 261 (Geol. Survey Mem., 1889).
145 Dale, *Hist. of Harwich and Dovercourt*, p. 100 (1730).

who have judgment to distinguish waters and used in drinks." Dale says,[146] however, that it is but "a small inconsiderable thing."

It has often been stated that this spring is that which was utilised in the establishment of Dovercourt Spa, but this seems not to have been the case. All the old writers who refer to the spring in question speak of it as yielding excellent drinking water; which would not have been the case had it had medicinal properties.

The establishment of Dovercourt Spa was part of the scheme of the late Mr. John Bagshawe, M.P., of Cliff House, Dovercourt, for the development of Dovercourt as a seaside resort,

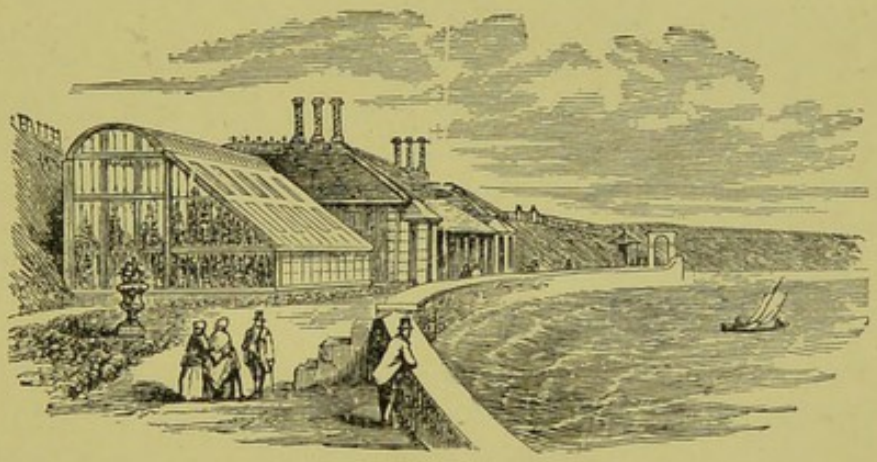

FIG. 6.—THE SPA HOUSE, DOVERCOURT.

about the year 1852; and the spring utilised appears to have been one discovered at that time. In 1874, the spa was spoken of[147] as

"a chalybeate spring, in great repute, possessing medicinal properties similar to the waters of Tunbridge Wells. The Spa-House, first opened to visitors on the 28th August 1854, is a neat brick building in the Tudor Style, and consists of a pump-room, saloon, library, and conservatory. In the pump-room and library, large bay windows look immediately over the sea. The library, in addition to a good supply of books and papers, contains many cases of fossils peculiar to the neighbourhood: also a large collection of Roman Antiquities."

The spa has continued to exist ever since the date in question, and still does so. The fossils and the Roman antiquities are no longer preserved in the Spa House (fig. 6), but the library and news-rooms are maintained and water is still sold regularly,

146 *Op. cit.*, p. 100 n. (1730).
147 *P.O. Directory, 1870*, p. 120.

price one penny per glass, in the pump-room. It is, indeed, the only Essex spa which now exists. Mr. H. Warren has been the proprietor for many years.

The author of a local guide-book, published in 1871, says[148] that—

"The Spa Water, when fresh drawn, is bright and sparkling. It is by no means unpleasant to the palate, producing no sort of constitutional disturbance—no flatulence, nausea, or dejection of spirits—but rather improves the appetite and strengthens the stomach. Its immediate effects on the system are tonic and stomachic. More remotely, . . . it promotes the assimilating powers of the digestive apparatus and gently excites a peristaltic action, softens and moistens the skin, corrects the secretions, and purifies the blood."

A Mr. Lever, a London chemist, who had analysed the water some time before this, reported[149] that he found six pints of it to contain the following ingredients :—

Oxide of iron	3 grains
Carbonate & sulph. of lime	6 ,,
Carb. & sulph. of magnesia	3 ,,
Chloride of sodium	1 ,,

[This shows, he says] a similarity to the waters of Tunbridge, with, however, a considerable preponderance of the most essential ingredient, the oxide of iron —a fact not to be wondered at when the quantity of iron pyrites found in the cliff is considered.

In June 1897, Mr. Warren submitted a sample of the water to Dr J. C. Thresh, the Medical Officer of Health for Essex, who reported as follows :—"I find the sample of water sent is a gravel water containing a trace of iron. There is no constituent, save the iron, which could be considered to confer upon it any medicinal properties. On the other hand, there are no objectionable constituents and organically it is very pure.

"The sample you sent contained under one grain of iron salts per gallon ; whereas the published analyses have four grains. The iron is deposited upon standing and probably is so deposited in the reservoir. If you could ensure it always containing the full amount, the water would be a useful tonic, for bracing up the system after illness, or when a person has 'run down.' For such people, a stay at the sea-side and a course of chalybeate water is exactly what is required."

Mr. Dalton takes, however, a different view as to the origin of this water. He writes that it comes from "the foot of

148 *Visitor's Guide to Harwich*, 4th ed., p. 35 (1871).
149 *Op. cit.*, p. 34.

a high cliff of London Clay, of an horizon very near the base of the series. I must demur to Dr. Thresh's description of this as a gravel water. Apart from its position, there is apparently no gravel within the possible range of supply. There is some beyond the summit of Beacon Hill, and a patch northward of the high road 500 yards to the west of the Spa. There may, of course, be pockets or channels in the clay surface, which have retained portions, more or less displaced, of the once-continuous sheet of gravel; and it must be remembered that nothing under 30 yards across can be mapped on the one-inch scale. But all the ingredients are such as occur in the London Clay."

IV.—GENERAL REMARKS ON THE MINERAL SPRINGS OF ESSEX FROM THE GEOLOGICAL POINT OF VIEW.—All water derived from wells, springs, or streams is primarily supplied by rain. The porosity of the surface on which it falls determines the amount carried off by streams or by re-evaporation. The streams, again, often lose into porous beds some of the water flowing from less pervious ground. The degree of porosity is of very wide range, from coarse gravel to clay of such density that a very thin seam will stop all percolation.

From the practical point of view, beds containing any notable proportion of clay may be regarded as impervious. The sources of true springs, or of yield to wells, are confined, therefore, in Essex, to Gravels, Sands, and Chalk.

In the case of thin seams of sand (*e.g.* in the London Clay), such probably absorb water from gravel beds or streams at one point and discharge it at another, often with mineral additions acquired in its transit.

Essex waters are derived, as stated above, from various sources—from the Sands and Gravels deposited by rivers in Post-glacial times at higher levels than their present channels; from the Glacial-sands and gravels underlying the Boulder Clay; occasionally, in small quantities, from the Boulder Clay itself; from sandy seams in the London Clay; from the Lower London Tertiaries (the Reading and Thanet Beds); and from the Chalk.

The River-gravel occasionally yields a water containing a small amount of iron (derived, in all probability, from the sub-

jacent London Clay), but never any other substance which could confer upon it medicinal properties.

The Boulder Clay covers a very large area in the central and northern parts of the county. The waters draining from it into, and those directly entering, the glacial gravels lying beneath it are often charged with considerable quantities of the salts of lime and sometimes of magnesia. Some which contain large amounts of these salts may be classed as "Mineral Waters," but those occurring in this county do not appear to possess any valuable medicinal properties. Those from certain of the localities indicated above have been valued for their chalybeate properties, but the iron which gives them these properties has been derived from the London Clay.

The London Clay is a fairly-homogeneous formation which extends over the greater part of the county and attains a maximum thickness of, perhaps, four hundred feet, decreasing to nothing at its northern and southern edges. The waters from the occasional seams of sand in it, especially near the base and at the upper limit, frequently contain a considerable amount of magnesium sulphate (Epsom salts) and calcium sulphate. These may be classed as "Mineral Waters" and they form a majority of those Essex waters which have acquired, in the past, a reputation for possessing medicinal properties. The last-named salt has, however, little or no medicinal value.

In the coastal parts of Essex, the Thanet Sands, and possibly also the upper beds of the Chalk, yield a water containing considerable quantities of sodium chloride (common salt) and sodium carbonate. Possibly, if these waters occurred on the Continent, they would be charged artificially with carbon-dioxide gas and sent over here for use as "Table-waters"; but they are so common in this county that they are regarded as potable, rather than as mineral, waters.

The presence of sodium carbonate, even in wells penetrating some distance into the chalk, is to be attributed to infiltration from the Thanet Sands. True chalk-waters are always hard, from the abundance of calcium bicarbonate they contain. Sodium chloride is generally attributed to marine percolation, and is most noticeable on the sea-board—increasingly so in late years, owing to the largely-extended demand for water, due to the development of the London invasion of Essex.

V.—GENERAL REMARKS ON THE MINERAL SPRINGS OF ESSEX FROM THE CHEMICAL POINT OF VIEW.—All the earlier writers who treated of the Mineral Waters of the County discussed very fully the chemical nature of those waters. Each propounded, with much solemnity and an air of profound wisdom, a great deal of absurd nonsense, which elucidated nothing. Such vague and pointless observations were usual in scientific works of the period—indeed, nothing of greater value could be expected in days when even the existence of the element oxygen was unknown. The remarks of these writers have, therefore, practically no value for us now.

Two of the later writers on the subject (namely, Phillips and Granville) record, however, investigations which still have scientific value, and of these we have availed ourselves.

In nearly every case, therefore, we have found it necessary to make our own investigations into the chemical composition of the waters of our Essex mineral springs, or such of them as can now be identified, and the result of each analysis has been given in its proper place above.

The methods of analysis followed cannot be described here, but they were identical with those given in detail in Dr. Thresh's book on *The Examination of Water and Water Supplies*, pp. 233-260 (1904). Such detailed analyses as those referred to in Chapter xiv. of the above work require weeks to complete: hence our attention was directed to the chief constituents and the estimation of all such as occurred in appreciable quantities.

Very many waters of a similar character to those analysed have been examined in Dr. Thresh's laboratory in recent years, and Dr. Thresh informs us that he has never detected any of the rarer elements, nor even traces of iodides, bromides, or fluorides, nor of salts of lithium, barium, rubidium, arsenic, etc., and that, except in polluted waters, potassium salts are only present in traces. We did not make, therefore, any special search for any of the above; but, had any been present in appreciable quantity, our results would have given some indication thereof and further tests would have been made. The absence of these constituents is only what might be expected from our knowledge of the natures of the waters and of the geological formations from which they are derived.

It remains for us to survey briefly the results obtained as a whole.

Speaking generally, we may say that, with few exceptions, the reputed Essex Mineral Waters which we have analysed for the purpose of this investigation cannot be regarded as Mineral Waters at all. The few which may be rightly so classed owe such small medicinal properties as they possess almost entirely to the presence in them of magnesium sulphate (Epsom salts). Waters containing this salt are in no way remarkable in Essex; for such waters are found in many parts of the county, and wells have frequently been abandoned, as sources of domestic supply, owing to the excessive amount of saline constituents present in their waters. Thus Dr. Thresh says[150] that,

"In the Hanningfield district, where the London Clay is exposed, the surface-water feeding the streams contains an amount of sulphate of lime and sulphate of magnesia (Epsom Salts) sufficient to render it useless for domestic purposes."

Elsewhere he says[151] that,

"Over certain areas (notably near Althorne, in the Maldon Rural District), the deep wells yield a water containing sulphate of magnesium (Epsom Salts). This is also the case at Hockley and elsewhere. This water, I suspect, comes from localised beds of sand in or under the London Clay; and, in more than one instance, I have found by experiment that the water arising from the bottom of the bore-tube contained no Epsom Salts. In one instance, the aperient water was entering the well at a point about 60 feet down; in another, about 10 or 12 feet down; and, in another, at a defective pipe at a much lower level. . . ."

Of the nine samples of water we have examined, only three can be classed as Mineral Waters—namely, those from South Weald, Upminster, and Hockley. Even these have, as stated already, little or no medicinal value, the amount of their saline constituents being small when compared with the quantity found in certain Mineral Waters occurring elsewhere.

The remaining six waters cannot be regarded as Mineral Waters in any sense, and they have no medicinal properties whatever. These are the waters from Little Dunmow ("Felstead"), Woodford, West Tilbury (both the Hall and the Rector's Well), Hornchurch (Havering Well), Stapleford Abbots (Curtis Mill Green), and Ilford (St. Chad's Well).

It appears, therefore, that our Essex Mineral Wells (so called) have, perhaps, obtained their reputations without being justly entitled thereto. It is conceivable, of course, that our

150 *Rep. on the Water Supply of the County of Essex*, p. 5 (Chelmsford, n.d., ? 1900).
151 *Op. cit.*, p. 36.

wells, or some of them, really did possess, at one time, the properties with which they were credited, and that those properties have become, in some way, lost or exhausted. Possibly, the water of medicinal value entered them originally at the bottom, but in time became excluded somehow, either through an accumulation of sediment or otherwise ; in which case, pumping the well dry and cleaning it out might restore to it any mineral properties it ever possessed. Possibly, again, such mineral salts as existed originally in the strata immediately adjacent to the well and gave character to its water have become, in the course of time, dissolved out and exhausted, either wholly or partly ; in which case, it would be difficult to restore to the well its lost mineral properties. Moreover, it is possible (as Mr. Dalton has suggested to us) that the nature of the waters in some of our wells may have been changed greatly by the accession of organic impurities, which have a considerable chemical effect on some of the mineral salts, especially those of iron and sulphuric acid. In this respect, disuse and deterioration of our wells may, by mutual reaction, have greatly changed the mineral constituents of their waters from those which obtained originally.

We think it more probable, however (and in this we are supported by the opinion of Dr. Thresh), that the waters of our Essex wells never possessed, in fact, any real medicinal value, and that " faith " was an important, if not the chief, element in the " cures " they are credited with. Probably this was the case even with our once-celebrated wells at West Tilbury. It must be remembered that many wells and springs, both in England and abroad, enjoy a high reputation for their curative properties, although their waters, when analysed with the utmost care, give no indication that they contain any substance of medicinal value.

We are bound, therefore, to conclude (at all events until further evidence comes to hand) that the cures reported to have been effected by the waters of some of our Essex springs resulted, probably, in the main, from the drinkers' own belief in the efficacy of the waters in question, though a period of quiet, simple, orderly living on the part of the patient was, no doubt, a necessary accompaniment of that belief.

At the same time, others of our Essex waters certainly

do possess some slight medicinal properties as shown by the effect the water at Tilbury and Hockley produce in the case of cattle, as noticed above.[152] This effect cannot, of course, be ascribed to the *fidei quantum sufficiat* which may have been operative in the case of human patients.

ADDENDA.

When the foregoing matter was read in abstract before the Essex Field Club, on the 30th November 1907, it gave rise to a lively and interesting discussion, in which Messrs. William Cole, F.L.S., W. H. Dalton, F.G.S., T. S. Dymond, F.C.S., Joseph Wilson, and Miller Christy, among others, took part. Mr. Dalton has been good enough to set down his remarks in writing, in the form of a short Critical Note, which is printed as an Appendix (p. 70).

At a subsequent meeting of the Club, on the 25th January 1908, Mr. Cole again brought up the subject for discussion. He reviewed the conditions of the wells at the time the samples of water were taken for analysis, and gave reasons for the supposition that some chemical or bacteriological changes might have taken place in such stagnant wells. He suggested that further analysis of samples taken under different conditions might possibly give results showing that the mineral reputations of the waters were not merely fanciful. Others who joined in the discussion were Mr. Miller Christy, Mr. Dalton, Mr. Wilson, Mr. John Spiller, F.C.S., Mr. W. Ping, F.C.S., and Mr. J. C. Shenstone, F.L.S. (see *Essex Naturalist*, xv, p. 259).

Subsequently, Mr. W. Whitaker, F.R.S., supplied additional information in reference to the wells at Chigwell Row and Woodford Wells, and Mr. Edwin E. Turner notes relating to the springs at Mark's Hall and Witham, as follows :—

The Witham Spa (p. 19).—Mr. E. E. Turner writes, as to the exact site of the well (see p. 25) :—"I well remember that, when I was a boy, nearly forty years ago, we used to count about a dozen

152 See *ante*, pp. 220 and 245.

paces from a certain spot and then jump on the surface of the soil, by which means we were enabled, by the hollow sound, to locate the well beneath. I believe the well is not closed in with brick-work, as you state. When I was a boy, tradition said that the well had been merely covered with planks and turfed over, because some animal had met its death by falling down it. Such statement was made on the authority of an old inhabitant, the parent of one of my companions."

The Mark's Hall Spring (p. 29).—Mr. E. E. Turner writes:—"I believe that I am able to indicate the site of this spring. It is, doubtless, that situated in the meadow known as 'Ladle Meadow,' between Mark's Hall Rectory and Tilkey, Coggeshall. Here, at the corner of a boggy grove, which is called 'The Well Plantation' on the 6-inch Ordnance Survey Map, there is still to be seen a stone basin, with a chain attached to it, which was formerly connected with a drinking cup. The water which flows into the basin is supplied by a quick-running brooklet, which rises near the top of the plantation and runs down the side of the meadow above-named. Close at hand is an hydraulic ram, worked by the stream, which I believe supplies the water to Bourchier's Grange. I first became familiar with this basin nearly thirty years ago, when I was told that it was 'a petrifying spring,' and that, if pieces of wood were left in it, they would eventually become turned into stone—a statement which I questioned, pointing out that it was a case of encrustation merely, due to a limy deposit left by the water. The chain mentioned is still considerably encrusted by such a deposit." While it is probable that this is the spring in question, it is impossible to be certain; for Allen gives no indication whatever as to the exact position in the parish of the spring he mentions.

The Colchester Spring (p. 31).—But for Allen's statement that this spring was at "the north end" of the town, one would feel inclined to identify it with a well-known spring in Childwell Alley. The latter is, however, in the south-east portion of the town, near St. Botolph's Priory. It is said that it was formerly customary for women who were with child to visit this spring and to drink its waters, owing to their salutary properties: hence its name. That this name is very ancient is certain; for the well has clearly given name to the Alley in which it is, and the Alley is mentioned in the records of the Borough at an early date. In the present day, the waters of the well retain a certain reputation as a cure for sore eyes. At an inquest recently held on a man who, having a diseased heart,

had died through drinking too much of its water, it was stated by Dr. J. M. Ryan, of Colchester (see report in *Essex County Chronicle*, 10th June 1910) that "a lot of people bathed their eyes with the water from this spring and he thought that, in mild cases, it was useful."

The Woodford Wells (p. 31).—These were referred to, but not described, in 1833, by Prof. A. Booth (*Mirror*, xxi, p. 229).

The Chigwell Row Spring (p. 43).—Prof. A. Booth, writing in 1833 (*Mirror*, xxi, p. 228), says :—" It is now quite neglected.'

APPENDIX.

Critical Note by Mr. W. H. Dalton, F.G.S.

I have but little more to say on this very interesting topic, as the authors have already embodied in their account all the determinations or surmises I have been able to offer as to the geological conditions of the several mineral springs, where their positions are sufficiently ascertained.

It will be seen that, with the exception of Tilbury, all the springs noticed are within the area of the London Clay, and their waters are derived either from sandy seams in that deposit or from its contact with superficial gravels over it, the gravels in the latter case furnishing merely the water, and the mineral ingredients being derived from the clay. In no case does the Boulder-clay take any part, so that the calcareous and ferruginous elements are always of local origin : at least, having been in the country from Eocene times, they cannot be regarded as of modern importation.

At Tilbury, where the source is in the Thanet Sand, the alkaline elements are probably also native, but here there may be some lateral admixture of marine salts from the adjacent estuary, besides those of organic contamination.

For the alleged beneficial action, I incline, with the authors, to assign the major part to the element of faith, but the mild action of the magnesian and ferric salts, concurrent with duly-ordered life, doubtless had its advantageous effect, similarly to that of the substitutes of modern fashion.

We now prefer our health "made in Germany" or thereabouts.

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