

**Researches on the conduct of the human uterus after delivery / by R. Heschl ; translated from the German.**

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RESEARCHES

ON

THE CONDUCT

OF

THE HUMAN UTERUS AFTER DELIVERY.

BY

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TRANSLATED FROM THE GERMAN.

With a Lithographed Plate.

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## RESEARCHES,

&c. &c.

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I MUST commence the description of the changes through which the uterus passes from the time of delivery till the completion of its new formation, with an outline of its condition immediately after birth has taken place.

Such a uterus occupies the greater part of the pelvic cavity and hypogastric region, and varies in weight, according to repeated trials that I have made, from 1 lb. 6-7 oz. to 2 lb. 5-7 oz. in twin cases. It feels firm, and is not easily torn, even when not contracted, as in cases dying suddenly in the last month of pregnancy. My inquiries concerning the capability of child-bearing are not yet full enough to become public.

Its size depends on the degree of contraction, so that in general it is from eight to ten inches long, of corresponding breadth, and has a wall an inch thick; its substance is pale red, almost white; that of the cervix flabby from serous infiltration, slightly torn at the external orifice, and penetrated by small extravasations.

Its veins, with the exception of those of the placenta-spot, are bound together by the contraction of the muscular structure ; are for the most part flat, either empty, or only filled with small, flabby, unadhering clots ; their coats are pale, thinner than those of the veins in the extremities of like caliber, in fact nearly in the same condition as other veins lying in parenchyma.

The capillaries are few ; the arteries and nerves, so far as I know, without any peculiar properties.

The veins of the placenta-spot are wide, probably from the same cause as in the last stage of pregnancy ; their walls are thin ; they are filled with dark-red or greyish-red clots sticking to their parietes, and gape into the cavity of the uterus, with their orifices plugged with these clots.

The placenta-spot, which always occupies a third part of the inner surface of the contracted uterus, still retains a projecting, uneven, and considerably lacerated surface.

The rest of the inner surface of the corpus uteri is composed of the bare muscular substance, from which hang here and there shreds, the remains of the decidua. The mucous membrane of the cervix is, in the great majority of cases, quite complete, with hypertrophied papillæ, glands, &c., and is covered with a good deal of jelly-like mucus ; in some cases this is deficient in some places, or up to the os externum.

I must, therefore, after repeated researches, dis-

sent from Robin and Kilian, as well as Arnold ; the latter of whom states that, as a general rule, the mucous membrane of the cervix is also lost ; whilst the two former advocate the formation of a new mucous membrane between the decidua and muscular structure of the human uterus during the period of pregnancy. The fact stated by Kilian,—viz., that in pregnancy of five or six months' duration, young glands, &c., are found in a cellular nidus, itself also in process of formation,—I do not deny, as well on account of its probability as in consequence of what I have seen. This fact alone, however, does not prove the above proposition, since it can be demonstrated that this stratum of glands, &c., continues regularly during pregnancy ; I am therefore obliged to contradict his assertion. The veins composing the plexus, which surrounds the uterus, are filled with thick blood ; the vagina is wide ; the external organs of generation, the cellular tissue of the pelvic cavity, and the ovaries, somewhat œdematous ; the peritoneal covering smooth.

From this day the uterus loses both in weight and volume, so that from weighing—

	lb.	oz.	oz.
Immediately after delivery, . . . .	1	6	— 8
At the end of the 1st week it weighs . . .	1	3	— 5
At the end of the 2nd „ „ . . . .		10	— 11
At the end of the 5th „ „ . . . .		5	— 6

And in the second month it comes down to its normal weight of  $1\frac{1}{2}$  to  $2\frac{1}{2}$  oz. ; whence it appears that



the most rapid diminution takes place in the second week after delivery, which is fully explained by the facts about to be mentioned.

Now in order to be, in my description, at once as full and clear as possible, I shall distinctly consider the structures of the uterus according to their histological and topographical differences.

1. The peritoneal covering, even after childbirth, which in other respects has passed through a perfectly normal course, is very generally found, a couple of days after delivery, covered with a slight exudation, whence arise, at a later period, adhesions of the uterus to the neighbouring organs.

2. The proper substance of the uterus undergoes so complete a transformation to molecular fat that not one single fibre of the uterus, existing previous to childbirth, remains behind. This transformation does not commence before the fourth or sixth day, and not after the eighth, pretty evenly at all points, the cervix, for the most part, continuing for a couple of days longer in the condition in which it was just after delivery; somewhat later the inner layer is found more advanced in its reconstruction than the outer. In the single muscular fibres this process of decay begins at many points at once; at first the slight serpentine appearance (Fig. I.) disappears; the outline becomes pale, and there appear (often arranged in rows) yellow granules, which, where the ends of the fibre cells are thin, lead to their early dissolution. The cell itself (Fig. II.) is pale, but well de-

fined, until the increasing quantity of fat granules obscure it. An absorption of the surrounding tissue must now very soon take place, which occurs simultaneously with the considerable and rapid diminution in weight above alluded to. With the advance of the fatty transformation the uterus becomes, in a corresponding degree, friable, and continues so till it has completely returned to its usual condition; it loses its reddish colour, becomes of a dirty yellow, and from these two circumstances (*viz.*, its friability and colour) is it possible, by a mere inspection with the naked eye, to perceive the termination of these changes, or even to know the size and weight of the organ at different periods of the process. In the fourth week there usually appears, when the uterus has almost resumed its normal volume, but is still yellow and friable, the first commencement of a new formation of uterine substance in the body of the organ, whilst (Fig. III.) in the outer layer nuclei cells, and, finally, cells drawn out into fibres (which assume completely the form of the subsequent muscular fibres) make their appearance and become evident as young uterine substance. This formation is rarely to be met with at an earlier period, and then only scattered here and there. Whilst the last portions of the muscular structure decay, and are absorbed, the new substance is developed at many points, so that, in the majority of cases, the reconstruction of the uterus is complete at the end of the second month. Puerperal diseases do not in general check,

in any appreciable degree, this chain of changes, even though the uterus be itself diseased; but on the other hand, the reconstruction, although unchecked, nevertheless in divers puerperal processes, both in chronic diseases and uterine malformations (as bicornis, &c.), gives rise to very serious modifications of the malady. These very newly formed fibres, instead of becoming consolidated, undergo very soon a fat metamorphosis, and this condition gives rise to the marked friability and yellowness of the uterus existing in such cases as have been just mentioned, even after some months. The "*marciditas uteri*" is then nothing more than a deficient reconstruction of the organ.

3. While the muscular fibres of the uterus undergo this fatty transformation, they seem under certain circumstances to become swollen (Fig. II.), and, more especially in the later stages about the fourth or fifth week, formations are found which cannot be otherwise explained.

4. The veins, with the greater part of the capillaries, are likewise formed anew, while their walls are contracted in the process of fatty transformation (Fig. IV.), after they have in all probability long ceased to convey blood, by reason of the contraction of the uterus.

5. The muscular substance of the cervix uteri undergoes the same transformation, with this single difference, that there often occurs an hemorrhage into its substance during the process, which has of

late been frequently, yet erroneously, explained as an extravasation occurring at the time of labour, and remaining behind. This latter certainly does sometimes happen, but at this period is in full process of change into pigment, and besides, even when this hemorrhage at the time of delivery does take place, still, new extravasations occur afterwards. I have satisfied myself by the most repeated researches that the name "apoplexy" which Rokitansky has given to this condition is a very suitable one, and not rather the reverse, as some one, I do not at this moment recollect who, has stated, and which, however, is repeated by all who have not the necessary material for investigation—that material which, according to Virchow, is essential for all inquiries into the processes of nature.

6. Some capillary vessels, with their contents, seem to undergo this gradual metamorphosis; at least things are found which can with great probability be so explained (Fig. IV.), because they quite accord with similar unequivocal forms met with, in the thyroid body, for example.

7. The placenta-spot undergoes a somewhat slower transformation, because in the normal state the veins themselves are filled with thick blood clots; these, as the transformation advances, produce a considerable protuberance of the uterine substance which lies between them, so that often, even after the fourth to the sixth week, the placenta-spot may still be found in the form of an elevated mark about the size of a

five-shilling piece; finally, however, even these clots, along with the veins, become completely resolved; the spot sinks back on a level with the rest, and having become smooth and covered with mucous membrane, can in general no longer be noticed. I say, in general, for I have still an observation of importance to add, viz., that sometimes the new formation of uterine substance following the absorption advances in this part with, as it were, excessive rapidity, and one finds, even several months after delivery, a prominence, the size of a crown-piece or larger, projecting from two to four lines, and consisting of uterine substance on the placenta-spot. Thereupon the coagula are completely absorbed, the rest of the uterus, in general itself of large size, but of normal consistence and firmness, develops a mucous membrane, strong and almost of the nature of decidua, a condition which, without doubt, in some cases lays the foundation of "*mola carnea*."

8. By far the most interesting part of the reconstruction of the mucous membrane (viz., the reconstruction of its vessels and glands) is unfortunately not very clear to myself; in spite of considerable expense of trouble and time, it falls a legacy to further research. What I have noticed consists in the following: a couple of days after the birth the entire inner surface of the uterus appears covered with a more or less red-coloured, soft, pap-like, flaky substance. If the mucous membrane of the cervix uteri continues to exist, then from its margin, or, if

not, from the exterior of the os, this substance, in the form of a very fine-meshed net (Fig. v.), is seen to spread over the inner surface of the uterus in layers, the thickness of a sheet of paper; whilst this net-work progresses, the under meshes by degrees become narrow and fall together, and the fretted inner surface of the uterus becomes everywhere covered with it. On microscopic examination it appears that this pap, at first pale, consists of pavement and cylindrical epithelium (also of mica-like cells?) whilst in the deeper layers lying immediately on the muscular substance it consists of young cellular tissue. It cannot, therefore, be imagined, that any save a very insignificant portion of the uterus which undergoes this fat change is carried off in the way of direct excretion (through the lochia), and that the reconstruction is so maintained or effected. The vessels first become evident in the third week, sometimes even later; at an earlier period the blood seems to be contained in the bare channels between the elongated cells. The glands appear last; in the majority of cases they were complete at the end of the second month; up to this I cannot trace their origin. This much, then, seems clear, that there is no meaning in the supposition that a complete formation of mucous membrane takes place before the uterus is reduced to its normal dimensions, nor has it been asserted as yet by any observer. According to my observations, the formation of the fully-developed vessels in the mucous membrane occurs in the way

above mentioned, and Fig. iv. *b*, is undoubtedly such a vessel taken from that membrane; yet I have never seen glands in a corresponding condition; and I am convinced that they do not exist earlier than when the uterus has nearly regained its usual dimensions. A constant property of this new formation of mucous membrane consists in the appearance of granular, yellow, rust-coloured or dark pigment, at first very abundant, but by degrees diminishing in quantity; its presence may be recognised by the naked eye up to the third month, on account of its tolerably deep rust-brown colour, and the varied spotting of the mucous membrane; even later it is discernible by the microscope. It arises from the slight hemorrhages before mentioned as occurring in the cervix, and from the metamorphosis of the blood and blood corpuscles in the obliterated vessels.

9. The vessels which lie in the middle of the uterus are, on account of their thick walls and size, distinguishable for a long time; in fact, it may be for ever.

10. This transformation follows likewise after abortion and twin pregnancies, in which the uterus is considerably larger than usual; in the latter it seems to last a little longer, yet one is generally in a position, from the size of the uterus as compared with the conduct of its substance, to draw a conclusion as to abortion or twin pregnancy if one accurately knows the appearances already sketched.

I keep for a further communication the conduct of the uterus in puerperal diseases.

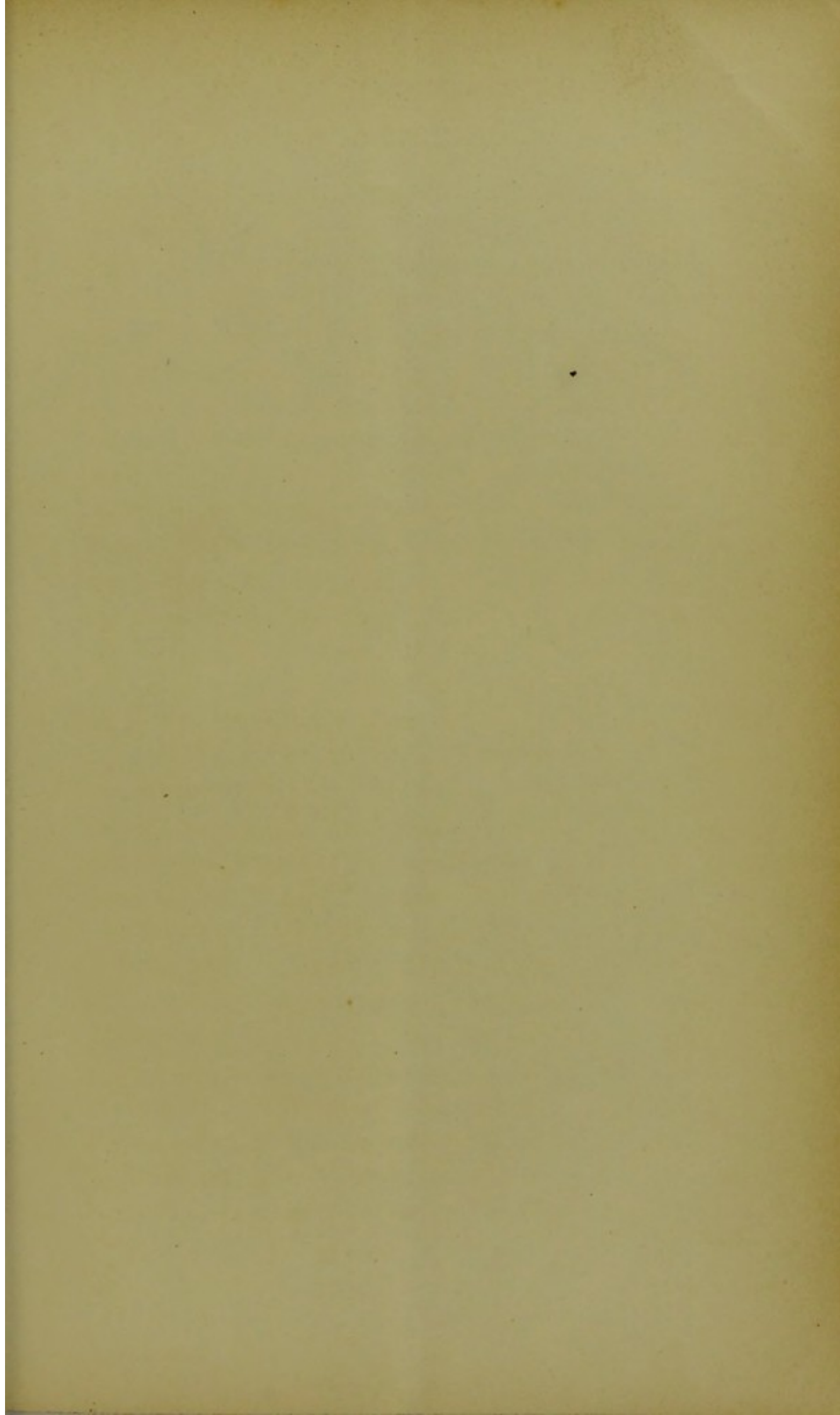




Fig 1.

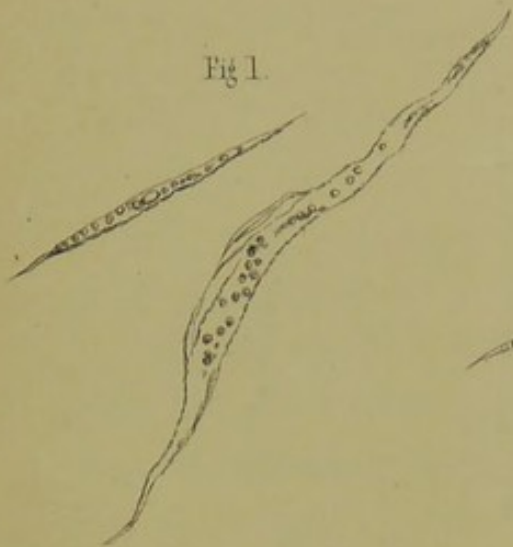


Fig 2.

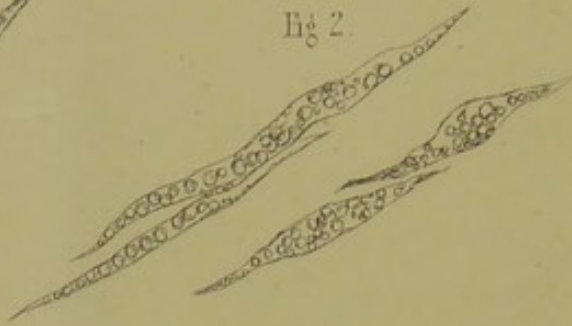


Fig 3.

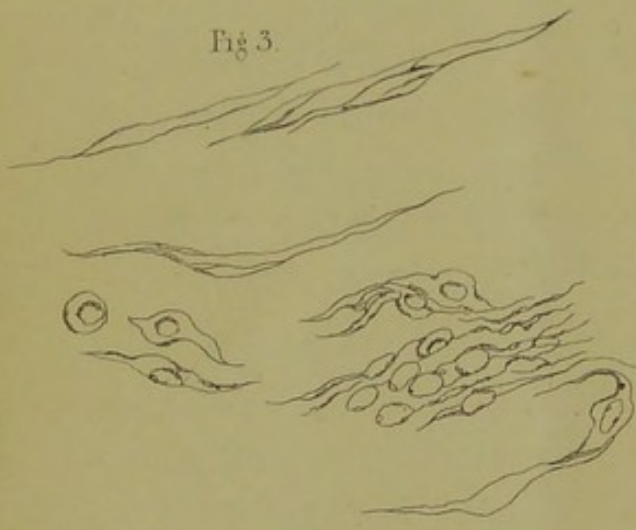


Fig 4.



Fig 5.



Fig 6.



## EXPLANATION OF THE PLATE.

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### FIG. I.

Muscular fibres of a uterus eight days after delivery.

### FIG. II.

The same fourteen days to four weeks after delivery.

### FIG. III.

The development of the new uterus fibres about the fourth week.

### FIG. IV.

*a*, A vessel from the uterine substance fourteen days after delivery ; *b*, a second from the newly-developed mucous membrane, four weeks after delivery, transformed to fat.

### FIG. V.

Pavement epithelium from the inner wall of the uterus, and a young cell of cellular tissue four days after delivery.

### FIG. VI.

*a*, Granular yellow and black pigment, free ; *b*, enclosed in cells: from the mucous membrane, two months after delivery.

EXPLANATION OF THE PLATE

The first figure is a view of the object as it appears in nature.

Fig. 1.

The second figure is a view of the object as it appears in nature.

Fig. 2.

The third figure is a view of the object as it appears in nature.

Fig. 3.

The fourth figure is a view of the object as it appears in nature.

Fig. 4.

The fifth figure is a view of the object as it appears in nature.

Fig. 5.

The sixth figure is a view of the object as it appears in nature.

Fig. 6.

The seventh figure is a view of the object as it appears in nature.

Fig. 7.

The eighth figure is a view of the object as it appears in nature.

Fig. 8.

The ninth figure is a view of the object as it appears in nature.



