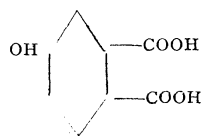


ed that the corresponding oxyphthalic acid has the following constitution.



Nitrophthalic acid, melting at 165° , has the second (II) formula, while the one melting at 212° , has the first (I) formula. As stated above, these are both produced from nitronaphthalene, which is itself an α compound, and so it is demonstrated that the α position is the one next to the two common carbon atoms. The hydrogen atoms in naphthalene are combined in groups of four, each of which is equivalent; this follows naturally from the observed facts in benzols.

Atterberg, in his masterly researches on the chlorinated naphthalenes, found that in naphthalene, the four α positions are of equal value without any reference to the benzol formula. According to de Koninck, Marquardt and Atterberg, nitronaphthalene may be converted into α monochloronaphthalene. Therefore, in these compounds, the nitro and chloro groups hold the same position. The monochloronaphthalene may, however, be converted into a nitro compound and that into a β dichloronaphthalene. Nitronaphthalene may be converted into two different dinitronaphthalenes, and those into two different dichloronaphthalenes γ and δ . Hence all three dichloronaphthalenes β , γ , δ , contain a chlorine atom in the position of the nitro group of the nitronaphthalenes. The three remaining chlorine atoms of the three compounds must take different positions with reference to the first, since otherwise the three compounds could not be different. All of the chlorine atoms of these compounds possess an α position, consequently the naphthalene molecule must possess four α positions of equal value.

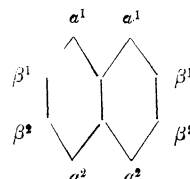
DETERMINATION OF THE CONSTITUTION OF THE NAPHTHALINE DERIVATIVES.

The constitution of naphthalene derivatives is ascertained by converting them by a simple reaction into another of known position. The nitro derivatives may, for instance, be converted into the chlorine or bromine derivatives by the chloride or bromide of phosphorus, and then by reduction into the amido derivatives. These latter may, by means of their diazo-compounds, be converted into phenols, chlorine, bromine (and perhaps iodine) derivatives, and by means of formic acid into nitriles, and consequently into carbon acids. The bromine derivatives produce, with ethyl and methyl iodide, ethyl and methyl compounds, and with chlorocarbonic acid ether carbon acids are produced. The sulpho-acids give with potassium cyanide, cyanates. With penta chloride and bromide of phosphorus, chlorine and bromine derivatives are obtained with sodium formate, carbon acids; and with sodium at a high temperature phenols are formed. On the other hand the oxidation often shows whether the substituting groups are in the same ring, or are divided among both; in the first case phthalic acid is formed, and in the second substitution products of phthalic acid are formed.

CONSTITUTION OF THE NAPHTHALINE DERIVATIVES.

The mono substitution products exist in but two modifications, and it is easy, therefore, to determine their constitution. When in the bisubstitution products, the two substituting groups are equal, ten different isomeric compounds are obtained. If, however, they are unequal, the number is increased to fourteen. The constitution of a given number of the same is exactly known, while with others it is only known that the substituting groups are contained in the same or in two different rings, that they possess an α or a β position, or a similar position.

In the case of the higher substituted naphthalene derivatives, the number of possible isomers is considerably increased, especially when the groups are unequal. When, however, the groups are equal, fourteen tri-derivatives, twenty-two tetra-derivatives, fourteen penta-derivatives, ten hexa, two hepta, and a single octo-derivative, in which all the hydrogen has been replaced, are obtained. There are, for example, seventy-five possible chlorine naphthalenes; of these, however, only twenty-four have been prepared. In order to simplify the nomenclature of these numerous compounds, we will distinguish the two from each other by designating the same position in each ring, as α^1 , α^2 , β^1 , and β^2 .



When a compound contains both of its substituting groups in the same ring, we will combine the latter after Jolin's method, that is, by a simple line, as for example, $\alpha^1-\beta^1$, $\alpha^1-\beta^2$, $\alpha^1-\alpha^2$, etc. When, however, the groups are divided between the two rings, then they are combined by double lines, thus: $\alpha^1=\alpha^1$, $\alpha^1=\beta^1$, $\alpha^1=\beta^2$, etc. The same method of lettering may be used in the higher substituted compounds; thus the compounds $\alpha^1-\beta^1-\alpha^2$, $\alpha^1-\beta^2-\alpha^2$, $\alpha^1-\beta^1-\beta^2-\alpha^2$, have their groups in the same ring. The compounds $\alpha^1-\alpha^2=\alpha^1$, $\alpha^1-\alpha^2=\beta^1$, $\alpha^1=\alpha^1-\alpha^2$, $\alpha^1-\alpha^2=\alpha^1-\beta^1$, have their groups divided between the two rings. We have placed together, in a series of tables, the most important derivatives of naphthalene. In these tables will be found their constitution as far as it is known; some characteristic properties, as their melting point, boiling point, their formation, conversion, and, as complete as possible, a list of the literature.

It is to be hoped that the many vacancies which appear among these tables may soon be filled.

Last of all we would observe that the terms α , β , γ , δ , etc., which we have chosen to represent the naphthalene derivatives have no connection with their constitution with the single exception of the mono derivative. They have been given to the different isomers only in chronological order, and they do not correspond by any means as far as position is concerned to the different α , β , etc., derivatives. This fact is unfortunate, because it may cause confusion. We believe, however, that at present no change should be made in names originally chosen by the discoverers. When the constitution of the naphthalene derivatives is better known, a rational nomenclature according to the above principles will naturally be adopted. Thus for instance the present β , γ and δ dichloronaphthalenes will be designated as $\alpha^1-\alpha^2$, $\alpha^1=\alpha^2$ and $\alpha^1=\alpha^1$ dichloronaphthalene, the α and δ trichloronaphthalene as $\alpha^1-\beta^1-\beta^2$ and $\alpha^1-\alpha^2=\alpha^1$, trichloronaphthalene, the α and β chlorodinitronaphthalenes as $\alpha^1-\alpha^2=\alpha^1$ and $\alpha^1-\alpha^2=\alpha^2$ chlorodinitronaphthalenes, and in a similar manner for all other compounds by which their constitution will be immediately recognized.

NATIONAL ACADEMY OF SCIENCES.

The abstracts of the papers read before the recent meeting at New York were, in all cases, either corrected or rewritten by the authors, and we are under obligation to Professors James Hall, Wolcott Gibbs, E. D. Cope, S. P. Langley, Henry Morton, Elias Loomis, B. Silliman, O. N. Rood, T. Sterry Hunt, Henry Draper, for their assistance in presenting correct reports.

The addresses of Professor Alexander Agassiz and Lieut. Shawatka were delivered *viva voce*, and we made use of the stenographic notes made for the New York

Tribune in these cases, which were submitted to the authors on the 4th of December last for correction or rejection; no objection being made we printed them in a recent number. After publication Professor Agassiz now writes that the reports under his name are not satisfactory to him. We therefore request our readers to consider them withdrawn.

Professor George F. Barker, Professor O. C. Marsh and Professor J. E. Hilgard are preparing more elaborate reports of their important papers, and promise them at an early day.

THE BRAIN OF THE ORANG.*

BY HENRY C. CHAPMAN, M.D.

The brain of the Orang has been figured by Tiedemann, Sandifort, Schroeder van der Kolk and Vrolik, Gratiolet, Rolleston, etc. On account, however, of the few illustrations extant, and of the importance of the subject, I avail myself of the opportunity of presenting several views of my Orang's brain (Figs. 1 to 5), which was removed from the skull only a few hours after death. The membranes were in a high state of congestion, and a little of the surface of the left hemisphere had been disorganized by disease, otherwise the brain was in good condition. It weighed exactly ten ounces. The brain of the Orang in its general contour resembled that of man more than those of either of the Chimpanzees which I examined. In these the brain was more elongated. The general character of the folds and fissures in

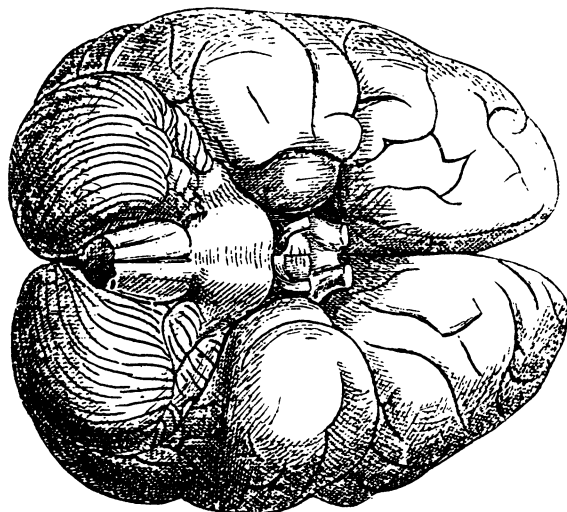


FIG. 1.

the brain of the Orang, Chimpanzee, and man are the same; there are certain minor differences, however, in their disposition in all three. The fissure of Sylvius in the Orang runs up and down the posterior branch pursuing only a slightly backward direction; the anterior branch is small. The fissure of Rolando, or central fissure, quite apparent, is, however, situated slightly more forward in the Orang than in man. It differentiates the frontal from the parietal lobe. The parieto-occipital fissure is well marked; bordered externally by the first occipital fold it descends internally on the mesial side of the hemisphere, separating the parietal from the occipal lobes.

in the Orang, the parieto-occipital fissure does not reach the calcarine, being separated from it by the "deuxième plis de passage interne" of Gratiolet, or "untere innere Scheiteltbogen-Windung" of Bischoff. I have noticed this separation as an anomaly more than once in man.

According to Bischoff, this disposition obtains in the Gorilla, and seems to be usual also in the Chimpanzee. In the female Chimpanzee, however, on the left side I found the parieto-occipital fissure passing into the calcarine, as in man. The frontal lobe is easily distinguished from the parietal by the fissure of Rolando, and from the temporal by the fissure of Sylvius. In the Orang it is higher, wider, and more arched than in the Chimpanzee. The anterior central convolution in front of the central fissure runs into the post-central convolution above and below, as in man. It is difficult, however, to identify the three frontal convolutions seen in man and the Chimpanzee, the frontal lobe of the Orang dividing rather into two convolutions, the middle one being badly defined. This is due somewhat to the length of the pre-central fissure, which is as long as the fissure of Rolando, extending farther upward than in man. There was nothing particularly noticeable about the base of the frontal lobe; on the mesial surface it ran into the parietal. The part above the callosal-marginal fissure in the Orang is not as distinctly divided into convolutions as in man, though these are not constantly present even in all human brains. The parietal lobe is separated from the frontal by the central fissure, from the occipital and temporal incompletely, by the parieto-occipital and Sylvian fissures. The posterior-central convolution is well defined. The parietal fissure in the Orang is more striking than that of man, resembling the Gorilla's; it is twice as long as the corresponding fissure in the Chimpanzee, extending from the transverse occipital fissure, as is sometimes the case in man, almost into the fissure of Rolando. It is unbridged and without a break, and divides the parietal lobe completely into upper and lower parietal lobules. The upper parietal lobule is bounded externally by the parietal fissure; posteriorly it is separated from the occipital lobe, internally by the parieto-

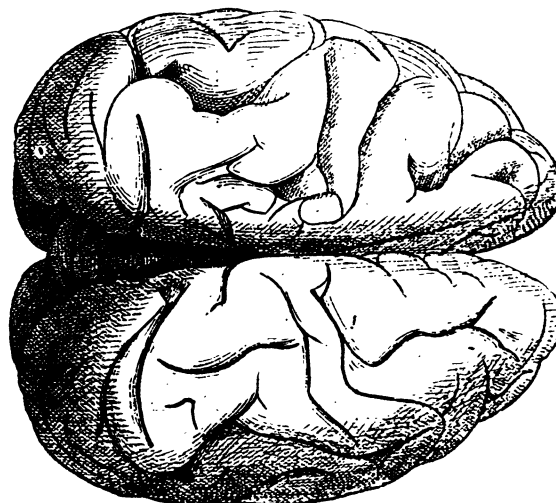


FIG. 2.

occipital fissure; externally it is continuous with the occipital lobe, as the first occipital gyrus, anteriorly it is separated from the posterior central convolution more completely than in man, by a fissure which runs parallel with the central fissure. There is in the Orang, also, a fissure running parallel with the parietal, which subdivides the upper parietal lobule into inner and outer portions. The precuneus, or the space on the mesial side of the parietal lobe between the parieto-occipital

* From the Proceedings of the Academy of Natural Sciences, Phila., 1880.