puscles of animal origin had been found in air which had been vitiated from certain sources, and how by means of the discovery the sources of evil were detected and hence done away with. Dr. Bartlett holds a strong opinion against the probability of finding specific disease germs in any form by which our present powers of observation can recognise them, but he is equally impressed with the indications afforded by the results of some of his experiments as to the noxious influence of animal organisms, including, perhaps, the specific matter of the various contagia and of tubercle, which are often contained in impure air.

Capt. R. T. Hildyard drew attention to the influence for good which might be exerted by medical men if, in the course of their private practice, they had more regard to the sanitary conditions under which their patients were living.—The Hon. J. A. R. Russell brought gether a large amount of carefully-prepared meteorological and other statistics to show how climate improved with slight elevation. In a series of conclusions to which his observations had led, he pointed out how the ranges of temperature, yearly, monthly, and diurnal, were less at certain elevations than in lower sites, and he regarded it most desirable that every house should be built on arches or on piers admitting of ventilation above the ground level, and that in country districts no house should be considered habitable of which the floor is on a level with or below the ground.—Miss Yates, Hon. Sec. to the Bread Reform League, pointed out the advantages of wheat-meal bread over white bread, both as regards its nutritive properties and otherwise, and urged its general use as a means of promoting national health, especially amongst the classes depending on bread as their main article of food.

ON THE PERCEPTION OF COLOURS BY THE ANCIENT MAORIS

In an interesting paper on this subject by Mr. Colenso, he gives a great deal of information on this subject, derived from his individual experience during a very long period of dwelling among the Maoris, and that before the country was settled, and by his having travelled very much among them, frequently in parts where no white man had ever been, sometimes on the battle-field, both during and after the fight, ever with them as medical man, often in the confidence of their best head men. The colours of black, white, red and brown were the prized and favourite ones. The purer states, especially of each of these colours were highly valued, to which may be added green and yellow. These several colours and their varying hues comprised nearly all that pertained to their dresses and personal decorations, to their principal houses and canoes. In the olden times a chief's house might truly be called a house "of many colours," which were artistically and laboriously displayed. Each tint or shade of colour bore its own peculiar name plainly and naturally, or figuratively sometimes both. They possessed a fine general discrimination of the various shades and hues and tints; they could give an accurate description of a rainbow, of all its various colours; they noticed the iridescent hues of the feathers of a pigeon's neck, of some shells, and the delicate evanescent tints on the ventral surfaces of many fish. From their general hues alone the Maoris could accurately tell whether far off and to them unknown districts were covered with a vegetation of fern or flax (Phormium) or grasses, but far above all their fine discrimination of delicate hues and shades was correctly shown in their nice distinction of the various tints of the flesh of the several kinds of kumara and taro. Once travelling on the coast, nearly forty years ago, Colenso met an old chief who told him that long ago he had cultivated a variety of the taro, which is called Wairuaarangi, but that it had long been lost. Knowing this sort from having met it in the north, and remembering the delicate and curious pink colour, Colenso tested the knowledge of the chief by asking what colour it was, which he immediately minutely described. They had early succeeded in getting brilliant black and red dyes. The old Maoris had a peculiar bias towards neutral colours. Blue was certainly known to them, and they obtained it from two sources, one mineral, the other vegetable; and they had even distinct names for several shades of blue. Throughout this paper Mr. Colenso criticises and contradicts many of the assertions made by Mr. Stack, from probably an insufficient knowledge of Maori, in a memoir recently published on the colour-sense of the Maoris (*Trans.* New Zealand Institute, vol. xiv. p. 49).

FRIEDRICH WÖHLER

WÖHLER is dead. A man, who was born four years after Priestley died, who worked with Berzelius, who was engaged in chemical research when the brilliant genius of Davy was ranging over the whole field of chemical phenomena, who was contemporaneous with Liebig and Graham—this man has but now passed away from our midst.

Wöhler witnessed, and well bore his part in helping on the many great advances which chemistry has made since the science was founded by Black, Priestley, and Lavoisier.

Friedrich Wöhler was born in 1800 near Frankfurt; he graduated as Doctor of Medicine at Heidelberg in 1823, but in place of pursuing the study of the uncertain art of medicine, as he tells us in his "Reminiscences," he determined to devote himself to the more exact science of chemistry. Recommended to Berzelius by Gmelin, Wöhler spent the winter of 1823-4 in the laboratory of the great Swedish chemist.

As we read the Reminiscences of Wöhler's youth—published a few years ago in the *Berichte* of the Berlin Chemical Society—we are ready to exclaim that it was impossible that, with the appliances which he had at his command, Berzelius could accomplish chemical work of any value. A few tables, an oil lamp or two, a large jar of water, basins and flasks—that was nearly all. The ancient Anna cooked in the kitchen, where also stood the sand-bath and the rarely-used furnace; Anna still spoke in these days of "oxidised marine acid gas;" but Berzelius was beginning to think that it might be better to say chlorine.

Five years later we come to a date memorable in the history of chemistry. Hitherto it had seemed as if the boundary which chemists had found it convenient to draw between organic and inorganic chemistry had a real existence in nature; but Wöhler's preparation of urea, in 1828, from constituents of mineral origin, showed that this chemical boundary was as unreal as any other drawn by the too ardent devotees of system; and that, as Graham said, in nature "distinctions of class are never absolute." The artificial barrier broken down, the living science of the chemistry of carbon compounds rapidly grew and overspread the place where the dead wall had been. Wöhler's discovery seemed a small one at the time, but what great fruit has it borne:

> "Walls admit of no expansion,
> Trellis work may haply flower
> Twice the size."

About this time (1830) the reaction led by Dumas against the Berzelian system of classification was growing in strength; in their zeal to overthrow the evils which had arisen from the axiom of the Swedish chemist—that every compound must be built up of two electrically opposed parts—chemists had sought likewise to demolish the conception of compound radicles, which formed so marked a feature of the Berzelian system.

But the classical research of Liebig and Wöhler on oil of bitter almonds" in 1832, recalled investigators to the true paths of advance. By recognising the existence in a series of compound molecules of a group of elementary atoms—which group they called *benzoyl*—Liebig and Wöhler were able to bring together, and so to explain the properties of compounds derived from this oil compounds which to the less imaginative chemist appeared to belong to altogether different classes of bodies.

Thus was inaugurated the modern conception of compound radicle, a conception which, being much more elastic than that of the Berzelian radicle which preceded it, and being at the same time sufficiently precise, was destined to lead to that of a replacing value for each radicle, and so to be merged in the wider hypothesis of the chemical equivalency of elementary atoms.

But in other and different fields the influence of the work of Wöhler has also been felt. Called to the Professorship of Chemistry at Göttingen in 1836, for more than forty years Wöhler pursued his investigations into the properties of metals and metallic compounds. Do we not owe to him much of our knowledge of aluminium and of nickel? Was it not he who taught us how to separate cobalt from nickel and from manganese? Did we not learn from him much concerning the properties of chromium, tungsten, tellurium, arsenic, and titanium?

His researches have thrown light on the chemistry of palladium and iridium, of beryllium and yttrium, and largely on the properties of silicon.

In 1833 Wöhler published the "Grundriss der Chemie," a book which is known wherever chemistry is studied, and which has been translated into the English, French, Dutch, Swedish, and Danish languages.

In 1861 the publication of his "Mineral Analysis" enriched analytical chemistry with methods of rare accuracy and general applicability.

Wöhler's translations into German of the *Lehrbuch* and *Jahresberichte* of Berzelius brought those classical works within the reach of every chemist.

But what shall be said of the influence of this great student of nature on others? Many a chemist looks to Göttingen as to the place where he learned what research means.

He has lived long and nobly; he has seen chemistry grow from a feeble plant to a spreading tree, and to that growth he has in no small measure ministered.

M. M. P. M.

PALÆOLITHIC GRAVELS OF NORTH-EAST LONDON

DURING the present spring and summer several new and instructive sections through the beds containing Palæolithic implements have been laid open at and near Stoke Newington. For the first time in my memory sections have been exposed which show the real age of the beds near the valley of the Hackney Brook, together with the older deposits on which they rest. Stoke Newington, Highbury, and Hackney are now so much built over, and where not built over, the surface of the ground has been so much disturbed for market gardening, brick-making, and excavations for sand and gravel, that one might live near the place for a lifetime and never see a section of four feet which would show the true nature of the uppermost deposits.

In NATURE, vol. xxv. p. 460, I described the "Palæolithic Floor" lighted on by me at Stoke Newington. This "floor" is a place where Palæolithic implements and flakes occur in large numbers. They are found about four feet beneath the surface of the ground, and nearly all the examples are as sharp as knives. That this was really a working place where tools were made in Palæolithic times is proved by the fact of my replacing flakes on to the blocks from which they were originally struck Hitherto I have described this "floor" as belonging to the Hackney Brook, and Dr. John Evans, in his "Stone Implements of Great Britain," p. 523, says: "The Shacklewell gravel lies on the slopes of the valley of the Hackney Brook." This in one sense, is really the case, but recent sections show that the Hackney Brook is quite modern, that it has cut its way through the Shacklewell gravels and only slightly disturbed them; in some places it has washed the "Palæolithic Floor" quite away. The "floor" really belongs to the Thames and the Lea, and one part of it occurs at the point of the former confluence of the two streams at four miles north of the Tower of London. It is also older than the "trail" or "warp" of the Rev. O. Fisher which occurs just above the "floor." The "floor" I now find to be by no means restricted to the slopes of the Hackney Brook, for I have seen a good section of it with tools and flakes *in situ* at three-quarters of a mile to the east of the stream and quite removed from its slopes. The present Hackney Brook may possibly follow some old depression left by previous denudation on the north bank and bed of the ancient Thames, but that is all. I have no doubt that the unabraded implement found at the bottom of a sand and gravel pit at Highbury by Mr. Norman Evans ("Stone Implements," p. 525) and compared by Dr. John Evans to the tools from Hoxne, High Lodge, and the cave of Le Moustier, really belongs to the "Palæolithic Floor," for I have an example recently found by myself near the Highbury position, which I know came from the "floor," for I there saw the "floor" in section. The unabraded implements, from their character and position clearly belong to a recent Palæolithic period, and they agree partly with the Le Moustier examples, but the Hackney Brook is far more modern than the most recent of Palæolithic times. At first the evidence seemed to indicate that the men worked on the old banks of the brook; it is now clear, however, that it was on the immensely older banks of the ancient Thames, that the men really fabricated their tools.

As no section through the "Palæolithic Floor" has hitherto been published, the accompanying illustration, Fig. 1, engraved to scale, will give an idea of its nature. The upper part of the illustration shows a section, facing the east, 300 feet long from north to south. It is taken through the gardens between Alkham and Kyverdale Road and south of Cazenove Road—the latter is shown on Stanford's Library Map of London. It is north of, and close to Stoke Newington Common. The south end, nearest the brook, is 83 feet 3 inches above the ordnance datum, whilst the north end is 90 feet 6 inches, showing a rise of 7 feet 3 inches in 300 feet—the heights are my own. Varying at from 4 feet to 6 feet from the surface there is a thin stratum of sub-angular broken flints and other stones seldom more than 4 or 5 inches in thickness, and sometimes obliterated or with only a single thickness of stones. This is the "Palæolithic Floor," and it is indicated in the upper part of Fig. 1 by the letters A, A, A. At 8 feet below the "floor" and about 12 feet from the surface of the ground is a bed of gravel and sand about 8 feet in thickness containing implements of older date; this bed is shown at the base of both the upper and lower sections seen in Fig. 1.

To more clearly show the nature of the "floor," the 60 feet of the upper figure (where marked) is engraved below to a larger scale; B is the 12 feet gravel containing rolled fossil bones and abraded Palæolithic implements; C is fine buff-coloured sand, often full of fossil shells of land and freshwater molluscs, D D D is the "floor," with its numerous unabraded tools and flakes; in the part illustrated, the "floor" is in duplicate. After the men had made their tools on the "floor" where the lower D's occur, a slight flood of water covered up the tools with a thin coating of sand; the men then walked over the