he remained from 1810 until he died on March 24, 1849. Döbereiner is credited with improving (and giving a correct explanation of) the making of vinegar; but he is best known for directing attention, in 1817, to the fact that the atomic weight of strontium is the mean of those of calcium and barium. He also noticed the same relationship with other 'triads' (chlorine, bromine, iodine; sulphur, selenium, tellurium). Dobereiner's 'triads' passed unnoticed at the time, and only after Newlands' 'law of octaves' and Mendeleef's Periodic Law had been enunciated some fifty years later did Dobereiner's work attract attention. It is also not generally known that he introduced, in 1832, the method of preparing oxygen from potassium chlorate by heating in the presence of manganese dioxide.

Government Grants for Research and Development

In the Supplementary Civil Estimates for the year ending March 31, 1949, aggregating £221,471,574, there are various sums for scientific research and like purposes in Great Britain. The additional £1,950,000 for development and welfare (Colonies, etc.) includes a further £450,000 for research schemes, making a total for the year of £750,000. An additional Treasury grant-in-aid of £600,000 is required to meet liabilities maturing in respect of capital grants already approved to the Universities and Colleges of Great Britain. Of the additional £152,000 gross for the Department of Scientific and Industrial Research, £86,000 is required for grants to students and others engaged in scientific research, £5,000 for grants to research associations and other bodies engaged in industrial research to match increased industrial contributions, £34,000 for extra-departmental research work, £16,000 against salary revision and £11,000 for salary revision at the Geological Survey of Great Britain and the Museum of Practical Geology. Appropriations-in-aid and certain anticipated savings reduce the supplementary estimate to £81,000 net. The Ministry of Supply requires a further £1,760,000 net for research and development, of which £360,000 is for research and development work carried out by industry, and £2,150,000 gross for plant, equipment, stores and materials for Government establishments. Among miscellaneous items are grants-in-aid of £6,000 for the Institute of Public Administration, £12,000 for the Imperial Institute, £20,000 for the British Institute of Management and £25,000 to the Council of Industrial Design for preparatory work for the Festival of Britain, these last falling under the Board of Trade vote. The supplementary estimate for the Scottish Home Department includes a grant-in-aid of £20,000 for the National Trust for Scotland.

Human Skull from Fontéchevade, France

Two years ago it was reported that part of a human skull had been discovered at Fontéchevade in the Charente district of France. The importance of this discovery is related to its antiquity, for according to the preliminary account it was found in association with implements of Tayacian type and with remains of the 'warm' fauna which preceded the Würm glaciation. The skull, therefore, appears to antedate Neanderthal man and to represent the most ancient human remains (stratigraphically well documented) so far discovered in France. A note on the specimen by H. V. Vallois has recently appeared in *Comptes Rendus* of the Paris Academy of Sciences (February 14). Unfortunately this note is very brief, and is illustrated by only one outline drawing of the lateral view of the skull. The latter consists of the greater part of the parietal bones and approximately the upper two-thirds of the frontal. These bones are unusually thick, and in this feature are comparable to the Swanscombe skull (which dates from the middle Acheulean period). It appears also that, so far as some of their main characters are concerned, they show no evidence of Neanderthal affinities. The supra-orbital part of the frontal bone is unfortunately missing; but the position of the upper margin of the frontal air sinus is indicated, and from this it appears certain that the curvature of the forehead region of the skull must have conformed closely to that of *Homo sapiens*. In other words, there is no evidence of a heavy supra-orbital torus of Neanderthal type. So far as this rather meagre evidence goes, the Fontéchevade skull confirms the evidence of the Swanscombe skull from the Thames valley that Neanderthal man was antedated in Europe by a type of man which approximated in cranial characters more closely to *Homo sapiens*. It is to be hoped that a full and well-illustrated account of the Fontechevade skull will not be long delayed.

Significance of Complementarity in Physics: *Dialectica*

The word 'complementarity' was originally introduced by Niels Bohr to express one of the most fundamental ideas in quantum theory, that we cannot simultaneously measure both the position and velocity of a particle—the more we know about one, the less we can know about the other. It is in this sense that we speak of our knowledge of the two quantities as complementary. But the idea is capable of wide generalization, since position and velocity (or momentum) are not the only pairs of 'conjugate observables'. Indeed, it is no exaggeration to say that a proper understanding of this principle is the greatest single contribution of modern physics to philosophy. The editorial board of *Dialectica*, a quarterly journal devoted to a review of the philosophy of knowledge, has done a public service by assigning the whole of the current issue (vol. 2, No. 3–4, published in Neuchâtel, priced 4.80 Swiss francs and obtainable from H. K. Lewis, 136 Gower Street, London, W.C.1) to a study of the single topic of complementarity.

The present issue is the more remarkable because no less than five Nobel prizewinners contribute to it. Pauli writes the editorial and briefly reviews the various subsequent contributions; Bohr describes the idea itself; de Broglie shows how it relates to the distinction between a complete unit (for example, a helium atom) and the individuality of its component parts (for example, electrons and nucleus); Heisenberg, to whom, of course, we owe the precise formulation of the uncertainty relations which lie at the heart of the idea, describes the progressive development of the concept; and Einstein restates one of his earlier arguments that present quantum theory is incomplete and requires to be supplemented, or replaced, by a new theory in which the state of any physical system is independent of any possible observations which might be made on it. Applications of the idea itself in the fields of biology and thought processes, and a possible way round some of the acknowledged difficulties in present-day quantum theory by the use of a non-Aristotelian three-valued logic in which statements may be either true, false or indeterminate, make up a most interesting volume.