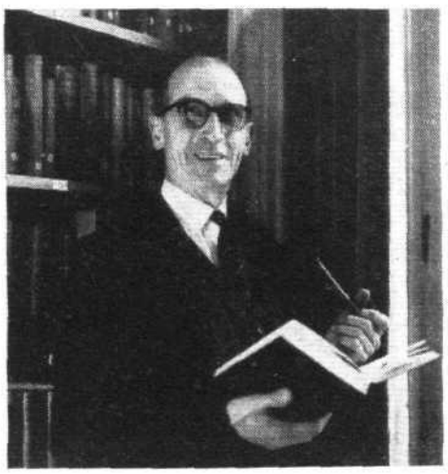
It would seem, from the opening paragraphs of the next session, that Wenham had asked a Mr Browning, FRAS (Astronomical, not Aeronautical), to construct the tunnel and the order had hardly been placed before a Mr R. A. Proctor (FRAS) had come forward with his hopes that "the inquiries will extend to the case of a plane body, caused to traverse the atmosphere (moving horizontally in its own plane)."

The same Mr Proctor said "I believe that the principle of the gyroscope will enter importantly into the construction of the aerial machine of the future." Unfortunately he said *construction*, and not *navigation*. The next paper in this session (1871) was by a civil engineer named Alexander on "Aerial Flight, as dependent on Man's Muscular Exertion." One of the contributors to the discussion was a Mr Sparrow; no comment.

The year's concluding remarks pointed out that two-thirds of the designs submitted were for the propulsion and guidance of balloons. The Society apparently did not think a lot of this, and persisted with its wind-tunnel experiments, for a tunnel had been completed and tested at Penns' Engineering Works at Greenwich. A table of results was given. "Though another season has elapsed, the Society has no announcement to make of a successful machine for aerial locomotion, or for travelling in any desired direction." Which might have been better expressed.

At the first meeting of 1872 "a new machine . . . for measuring the relation between the velocity and pressure of the wind" was exhibited. A footnote to the first page implies that if some of the papers appear to be so much bunk, they are printed in the hope that there may be some grain of sense in them. The new machine was the Wenham and Browning wind tunnel, and Wenham described its working. Judging from the brisk exchange of question and answer in the discussion, the wind tunnel idea caught on.

In the *Daily Telegraph* of December 7 last an article concluded "Little is heard in this country about the study of insects in this context of man-powered flight. . . ." In the annual report of the Aeronautical Society for 1872 is given a translation of a French paper entitled "The Movements of the Wing of Insects." This was an extension of some abstracts that had previously been published in the report and were now printed *in extenso* in response to the demand of the membership. They cover pages 25 to 74 and are illustrated.



The historic documents illustrated in these pages are in the RAeS library under the care of Frank Smith, author of this article

(Right) Paid-up members in 1865: a page from the account book. On the following page the subscription total rises to £27 1s

In 1873 Mr Artingstall persisted with his ideas for man-powered flight. D. S. Brown read a paper on the Aëroplane with such headings as "Construction: Position: Stability: Propellers: Motors:." He referred frequently to that father of flight, Sir George Cayley, to whose writings he had evidently given much time. In this year, too, appeared a paper that was so long that it could not be read at a meeting. By James Armour, C.E., it was called "Wings for Man." A preamble remarked "the manner in which the question is treated will show that the title 'Wings for Man' signifies not wings absolute, but wings in the form of a proposition simply." You can't have much fairer than that. Fifty-three pages of it, in thirteen chapters.

It is interesting to note that costs come into a paper read in 1874. Mr Moy asked the price of aluminium for constructing a boiler. Mr Brown said about 8s per oz. Mr Wenham said it was about 5s in bulk and the chairman came in with the opinion that it could be got at about 4s. That's how things start.

Again, in 1874, Mr Armour had a paper which was taken as read. His "Resistance to falling planes on a path of translation" ran to 25 pages, but the type is larger than the previous marathon effort. In the concluding remarks to this year appear what may be the first steps in direction finding. Captain Burnaby of the Society's council dropped from his balloon two parachutes, with an interval of time between their liberation. By observing the direction of a silken cord which connected the two, he was enabled to verify his course. No further directions are given.

The opening meeting of 1875 was notable for Thomas Moy's paper on his Aerial Steamer. With its appearance of owl's eyes and no body this made one of the best-known of the old illustrations. It was followed by a rather depressing paper by the chairman on "Death of Crocé-Spinelli and Sivel." The discussion was most lively.

Now follows another of those papers that were printed but not read. It is called "Angus and Mack on the Air Path" and is a species of cross-talk act between, for some unknown reason, two Scots. In dialect, too. If two comedians would only learn the 27 page "script" it would be a riot on today's radio.

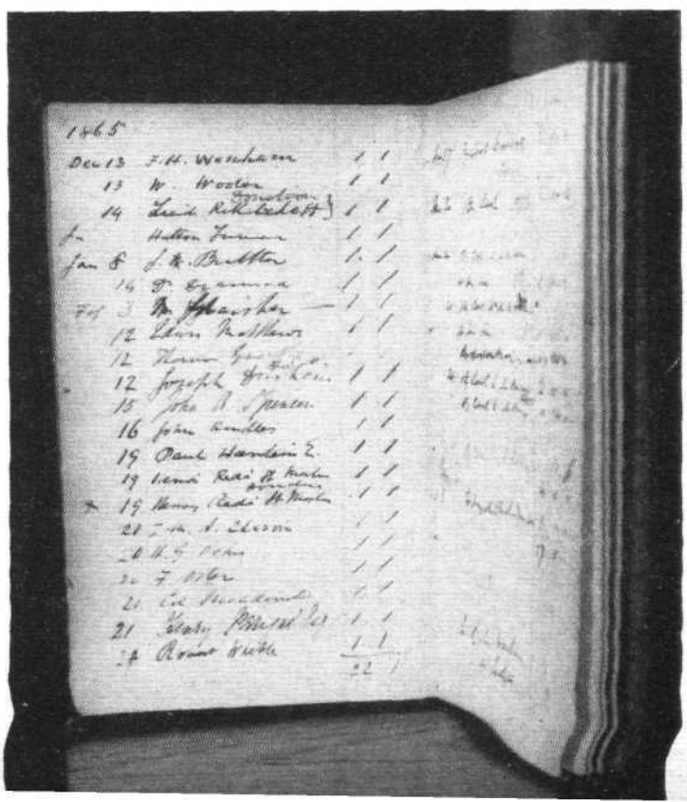
In 1875, Brearey, the hon secretary, was awarded the Gold Medal of the Société Française de Navigation Aerienne; and this is really the only item of Society interest in the concluding remarks for that year.

The 1876 report is largely made up of translations of papers by Pénaud and the reproduction of Cayley's "On Aerial Navigation" in *Nicholson's Journal* of 1809 and 1810. Among the concluding remarks for the year is a report of the death of Mr Artingstall of Manchester, who (as we have already implied) was a vigorous contributor to the earlier annual reports.

In 1877 there were one or two acrimonious discussions, including one on the omission of a balloon from the "Challenger" polar expedition. At the end of the report was reprinted an 1810 "Treatise upon the Art of Flying" by one Thomas Walker, a portrait painter of Hull: another demonstration of the fact that in those days it was not considered necessary to have any special qualifications for aeronautical authorship. A note of the books received during the year mentions "Angus and Mack on the Air Path—Part III," and the author is none other than James Armour.

The report for 1878 opens with the annual meeting on June 13, with the redoubtable James Glaisher still in the chair. Mr Moy opened with a defence of his flying model and was followed by Mr Cradock on "The Power possessed by Man in Relation to Aeronautics." There are other communicated papers, but no report of a meeting. There was, however, an Aeronautical Club which met each month, on the third Tuesday from October to May. The Annual Subscription was 10s 6d.

The concluding remarks for the year 1879 start with the simple sentence "Balloons have again come to the front." It goes on "There seems to be a recurring cycle when men, hopeless of macadamizing the aerial highway, resort again to the gas bag." Gas bag, here, is literally descriptive and not a vulgarism. The subsequent remarks are somewhat disparaging of those who were thinking in terms of what we now know as the airship, but there is a bit of happy prophecy in dismissing the cigar or cylinder: "There may, and probably will, arise conditions in warfare in which considerations of expense in the attainment of an object will sink into insignificance in the prospect of success."

The 1880 annual report shows a returning interest in the flight of birds. In June *The English Mechanic* published a series of letters on this subject and the correspondence is reproduced in the ASGB report. This may have been because of a dearth of other material, for in the short history he produced in 1946 Capt Pritchard says that the years 1881 to 1896 found the Society in the doldrums. It is interesting, nevertheless, to see, in the annual report for 1882, correspondence signed by a gentleman from University College, Bristol, named H. S. Hele-Shaw. This was reproduced from the *Engineer*.

(*To be continued*)