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REVIEW OF  
 "PROCEEDINGS OF THE INTERNATIONAL METEOROLOGICAL SATELLITE WORKSHOP  
 NOVEMBER 13-22, 1961"  
 U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C., 1962

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As things stood in the Fall of 1961, the U. S. had launched three remarkably successful meteorological satellites (TIROS I, II, and III), and the information transmitted from the TV cameras and infrared detectors of these satellites had already created a stir in meteorological circles. There can be no doubt that operational forecasters and research meteorologists around the world had been deeply impressed by this newest weather observation tool. So, with an eye to both the advancement of science and the fostering of good will abroad, the National Aeronautics and Space Administration (NASA), and the United States Weather Bureau (USWB) jointly organized the Symposium or "Workshop" that is the subject of this volume.

The Workshop held in Washington, D. C., in November 1961, was attended by visiting meteorologists from 29 different countries (14 from Europe and the Near East, 7 from South America and the Caribbean, 3 from Africa, 3 from the Far East, plus New Zealand and Canada). Neither the Soviet Union nor any of her satellites were represented. The agenda for the meeting was a rigorous one, and ran through a progression of talks beginning with formal welcomes by a carefully chosen selection of leaders in the sponsoring agencies led off by Mr. James E. Webb of NASA and Dr. Harry Wexler of the

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This paper was prepared for publication in the Transactions of the American Geophysical Union

USWB), followed by brief talks by representatives of the WMO and ICAO, and proceeding through general technical introductions, substantive papers on various special aspects, a laboratory exercise, and visits to NASA and USWB facilities. The talks, and much of the discussion following the talks, are all included in the Proceedings, along with an Appendix giving further details on how the TIROS system operates. (We note that a very pleasant cocktail party held at the famous Blair House is not mentioned.)

~~This volume, then,~~ *The Proceedings* serves as an excellent source book of information on U. S. weather satellites and their use, and a brief description of what the future holds if all goes according to plan. One can read about the mechanism of the TIROS, how it observes the clouds by TV and scans a courser picture in several infrared spectral bands, how the data are sent to the ground, processed, and presented, and, of most interest to the gathering, how they are used for research on the atmosphere and to aid operational forecasting (more on this later). There is also a report on the NIMBUS system that will succeed TIROS, and on the U.S. plans for setting up new readout and communications facilities for handling the increasing volume of meteorological satellite data expected in the future. In fact, it is hard to think of any important facet of the subject that has not been at least touched upon in this collection of reports. The various speakers from NASA and the USWB have prepared their material well on the whole, and many of the reports deserve careful reading if one wants to understand this new development in meteorology.

The Proceedings also relay some revealing questions and comments by the invitees from abroad. We note that the theme for many of the questions was related to: How can we in our country get and use meteorological satellite data? For example, M. E. Nancoo (Jamaica): "We come from an area where there is very little information and depend much more on the TIROS pictures than most people. However, the information can be misleading. So we would like to put things in true perspective..." And A. Pallmann (El Salvador): "...Between the time of picture taking by TIROS and the

transmission... 12 to 15 hours elapse. It is clear that because of this delay the nephanalysis (of the TIROS cloud pictures) can serve only for a check of clouds over the ocean and there is no chance for direct synoptic application..." (p. 105). By far the longest recorded Question Period followed the talk of A. W. Johnson (USWB) on "Supporting Meteorological Observation," in which he discussed how other countries could get into the program by making special observations in conjunction with the passage of a meteorological satellite, and how they could get satellite information in return.

This impatience on the part of meteorologists in other countries who are hungry to take advantage of weather satellites is to be expected. Clearly, a major problem now is communications (not a new problem to weather men, alas!). There was considerable discussion of this by A. W. Johnson (USWB) in his talk and in the discussion that followed, and one should note especially the remark by Kaare Langlo (WMO): "In order to improve distribution of these (satellite) data, it is most important that each country take the necessary initiative to improve its own telecommunications. You cannot expect that the WMO can do everything in this connection. I can assure you that we are trying every possible means of improving these communications. This is not sufficient. We need the full support of every country... Our (WMO) panel of experts on satellites ... recommended the transmission of photomosaic pictures, which unfortunately is not possible because the means are not available..." (p. 160).

It was noted by D. G. James (U.K.) that there had been little or no mention of upper air or composition measurements from satellites such as ozone, nitrous oxide, oxygen, dust, etc. (p. 173). As M. Tepper (NASA) and S. Fritz (USWB) explained in reply, the Workshop was purposely restricted to the meteorology of the lower atmosphere, even though in both the U. S. and the U. K. there are extensive satellite (and rocket) meteorology programs that go beyond this. Fritz goes on to briefly describe a program for measuring free air temperature and possibly water vapor

distribution by infrared observations from satellites. (See also the papers by W. Nordberg, D. Q. Wark, J. S. Winston, and V. E. Suomi for hints of some of the extraordinary opportunities that may open up as we learn better to use satellites for observing the atmosphere below them.)

Finally, as a general impression, one can sense throughout these Proceedings an undercurrent of excitement and pride on the part of the U. S. scientists and engineers, a feeling that seems to have been noted by the participants. The hosts for this meeting had, indeed, much to be proud of, since the meteorological satellite program is one of the most successful ones in the U. S. space effort. As Kaare Langlo (WMO) put it in a concluding statement: "...It is indeed a pleasure for me to express our sincere thanks to the United States for what it has done in the field of satellite meteorology, not only measured in dollars and personnel, but in initiative and enthusiasm which cannot fail to bring our science forward..."