breakthrough if we had been content with the (as such very correct) statement that the cholinergic brain systems "may be fairly closely linked to whatever is fundamentally aberrant" in the Parkinsonian brain: it is precisely this "whatever is fundamentally aberrant" that opened up completely new possibilities.

Turning to the comments directly related to the theme of my article, that is noradrenaline and schizophrenia, Iversen *et al.* note that "changes have been found for levels of dopamine and noradrenaline and/or their metabolites in schizophrenic brain of spinal fluid", but that "on balance the changes have been modest and not consistently reproduced in different laboratories". This statement certainly is true for the various studies reporting changes, or lack of changes, in dopamine and/or its metabolite homovanillic acid¹⁻¹⁰, or dopamine receptor sites^{9,11-16}, from which no consistent picture can be derived. This is not so, however, with the reported changes in noradrenaline levels in schizophrenia. First, there is a consistent body of published cerebrospinal fluid results, all showing the same: a significantly above-normal level of cerebrospinal fluid noradrenaline in schizophrenic patients, especially those belonging to the paranoid subgroup¹⁷⁻²⁰. Second, it is this subgroup, the paranoid variety, in which an impressive increase in brain noradrenaline has been reported²¹⁻²³; other schizophrenic subgroups, if analysed, did

not show this change^{7,22,23}. Thus, the question of noradrenaline in schizophrenic brain crucially depends on this diagnostic distinction²⁴, and studies which did not pay attention to this difference produced much less impressive results^{4,5,25}.

Regarding, finally, the excellent idea of Iversen *et al.* that in schizophrenia research "future effort needs to be directed to understanding of the nature of the relationship between dopamine and other modulatory neuronal systems in the brain", a whole section in my article in fact dealt with exactly this topic, namely the possible interrelationship between the dopamine and the noradrenaline systems in the brain and shows why I think that the involvement of noradrenaline in schizophrenia deserves serious consideration.

In conclusion, there is, on careful examination, less contradiction in reports on brain noradrenaline changes in schizophrenia, or at least its paranoid variety, than there is in reports on dopamine in schizophrenia. At present, therefore, the direct neurochemical evidence for abnormal noradrenaline in schizophrenic brain looks better than any such evidence for a direct brain dopamine disturbance. This is why I find the case of brain noradrenaline more convincing than the case of brain dopamine; which does not mean that future research could not change my view in favour of a more relevant disturbance in some other brain neurotransmit-

ter system or systems, dopamine not excluded. □

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Astronomy

IRAS circular 3

THE goal of issuing circulars biweekly has proved to be more difficult to achieve than we had expected. The source-selection algorithms have undergone several revisions, but they are still not sufficiently well refined to cope with the complexity that we observe in the sky. We believe, however, that this and subsequent circulars will be significantly more reliable than the first two.

It was discovered that the source listed in circular no.2 (*News and Views* **304**, 218; 1983) as 0320+613P02 had been reconstructed by the data-processing system out of several nearby sources. Thus the flux densities quoted are meaningless, and the entry should be disregarded.

This circular presents the observed positions and flux densities of 43 sources. □

G. Neugebauer and H. Habing

The source name consists of four parts: (1) the letters 'IRAS' to indicate the origin; (2) the right ascension (RA) in hours and minutes, seconds omitted; (3) declination (Dec) in decimal degrees, multiplied by 10 and then truncated (thus +32° 42.3 min becomes +327); (4) an appendix starting with 'P' and followed by the number of the circular; this appendix stresses that the data are preliminary. Position is given at Equinox 1950.0. The measurements have been made between Epochs 1983.1 and 1983.3. Wavelengths (μm): band 1: centre 12, width 6; band 2: centre 25, width 11; band 3: centre 60, width 40; band 4: centre 100, width 37.

Source IRAS	RA (1950) h min s	Dec (1950) deg arc min	12 μm	25 μm	60 μm	100 μm	Source IRAS	RA (1950) h min s	Dec (1950) deg arc min	12 μm	25 μm	60 μm	100 μm
0125+847P0	01 25 28	+84 45.2	<0.2	<0.2	0.50	2.3	0445+513P0	04 45 32	+51 19.2	6.8	7.4	2.6	<6.0
0344+728P0	03 44 59	+72 52.7	<0.4	0.69	6.0	14.0	0447+428P0	04 47 42	+42 48.9	<0.8	0.62	7.0	14.0
0356+216P0	03 56 33	+21 39.3	<0.2	<0.2	0.76	1.9	0448+445P0	04 48 09	+44 31.0	<0.4	0.55	6.0	11.0
0402+212P0	04 02 19	+21 14.3	<0.2	<0.2	1.2	2.6	0453+444P0	04 53 05	+44 28.0	87.0	89.0	23.0	8.4
0406+085P0	04 06 30	+08 31.1	<0.2	<0.2	0.95	4.8	0500-030P0	05 00 46	-03 00.4	<0.2	<0.3	3.3	8.4
0409+054P0	04 09 42	+05 25.1	0.55	0.79	9.3	20.8	0503-100P0	05 03 35	-10 03.0	<0.4	0.30	2.4	5.3
0413+081P0	04 13 24	+08 03.5	<0.2	0.68	5.4	7.0	0504-063P0	05 04 40	-06 22.7	<0.2	<0.2	3.1	<1.0
0414+011P0	04 14 07	+01 03.6	<0.2	<0.2	0.77	2.3	0504+442P0	05 04 51	+44 16.9	<0.2	0.64	5.0	12.0
0414+001P0	04 14 11	+00 09.0	<0.2	<0.4	2.0	4.0	0508-094P0	05 08 45	-09 27.0	<0.3	<0.3	3.0	7.7
0414+103P0	04 14 29	+10 20.1	<0.2	0.30	3.1	8.5	0509-204P0	05 09 29	-20 29.2	<0.2	0.63	4.2	9.2
0416+031P0	04 16 13	+03 06.6	<0.2	<0.2	0.75	2.9	0509-151P0	05 09 30	-15 11.7	<0.4	0.39	3.0	5.9
0417+751P0	04 17 03	+75 10.7	0.41	0.89	10.0	31.0	0509-157P0	05 09 48	-15 44.8	0.39	0.64	7.8	23.0
0423+536P0	04 23 50	+53 36.4	0.67	1.4	11.0	30.0	0510-244P0	05 10 05	-24 25.5	<0.2	0.40	4.7	7.3
0425+695P0	04 25 40	+69 30.2	3.7	3.9	<0.5	<3.0	0511-106P0	05 11 44	-10 41.0	<0.2	<0.2	2.9	7.9
0426+523P0	04 26 45	+52 20.6	<0.3	<1.0	12.0	100.0	0514-124P0	05 14 26	-12 24.2	<0.2	0.51	3.7	6.6
0432+476P0	04 32 15	+47 36.9	<0.4	0.56	5.1	15.0	0514-238P0	05 14 33	-23 50.5	<0.2	0.31	2.3	4.4
0433+438P0	04 33 31	+43 49.6	<0.3	0.69	8.3	21.0	0517-180P0	05 17 20	-18 02.5	<0.3	<0.3	2.3	3.8
0433+605P0	04 33 39	+60 34.1	<0.6	<0.3	4.5	7.8	0517-184P0	05 17 33	-18 27.6	2.1	2.5	<0.3	<1.0
0434+485P0	04 34 31	+48 35.7	0.46	1.4	13.0	23.0	0519-262P0	05 19 28	-26 17.2	<0.2	<0.2	1.8	3.8
0435+676P0	04 35 40	+67 38.3	<0.2	1.6	5.8	7.1	0524-218P0	05 24 07	-21 53.4	<0.2	0.26	2.3	6.5
0436+492P0	04 36 15	+49 13.0	0.46	1.3	5.5	24.0	1835+387P0	18 35 15	+38 44.2	28.0	8.7	11.8	7.1
0438+573P0	04 38 36	+57 22.1	17.0	24.0	5.1	<3.0							